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Land Tenure and Farm Performance in Zambia's Southern Province

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degree of Doctor of Philosophy

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ABSTRACT:

Land tenure reform has long been advocated as an instrument of development in sub-Saharan Africa, based on a neo-classical economic model promising that titling would promote land improvements, credit supply, and efficient land markets, causing greater agricultural productivity. However, empirical studies in Africa have largely failed to find the promised effects; indeed they have revealed negative effects of titling policies, which can worsen the tenure insecurity of poor farmers whom such policies should have helped. This thesis reviews the literature to explore why the neo-classical model has not borne fruit in sub-Saharan Africa, describes inherent weaknesses in the model as applied to the African context, and suggests methods by which the model could be better tested before dismissing tenure reform as a possible instrument against poverty.

Analysis is presented of original survey data collected from 266 households in an area of Zambia with contrasting and adjacent tenure regimes (state and customary). By means of regression techniques (supported by qualitative data), the hypotheses are tested whether farmers with leases or titles have superior fixed investment, credit use, and productivity to those without documentation. Results indicate that fixed investment is indeed greater on documented land, even controlling for socio-economic variables. So is productivity (total crop value per capita), via the mechanisms of cotton planting, cattle ownership, and fixed investments *inter alia*. Cattle ownership emerged as an unexpectedly strong and consistent correlate with fixed investment, credit use, productivity, and income (which also associates with fixed investments). Farms on state land without title or lease did not perform better than those on customary land, suggesting that weak or inefficiently-administered statutory tenure is no improvement on customary tenure. These results differ from many previous studies in discerning productivity and income effects of tenure, and suggest that tenure reform may yet help to alleviate poverty.

Table of Contents

Chapter 1: INTRODUCTION.....	13
Chapter 2: THE LITERATURE ON LAND TENURE REFORM IN AFRICA	16
2.1 Land Reform, Agrarian Transformation and Development.....	16
2.2 Redistributive Reform and its Links with Tenure Reform	17
2.3 Tenure Reform	21
2.4 Assessing the Evidence on African Land Tenure Reform.....	23
2.5 Multiple Meanings of Land.....	27
2.6 A Related Model: the Evolutionary Theory of Land Rights.....	29
2.7 Land is not the scarce factor of production.....	31
2.8 Mis-diagnosis of insecurity or communality of customary tenure	32
2.9 Definitions of Tenure Security	35
2.9.1 The Relevance of Titling	35
2.9.2 Disaggregating the Components of Tenure Security	37
2.10 Low Demand for Credit	40
2.11 Land Market Activation.....	42
2.12 Technology.....	44
2.13 Governance.....	45
2.14 Research and Policy Frontiers for SSA Land Tenure Reform	47
2.15 Property Rights and Power.....	53
2.16 Land Rights and Gender in sub-Saharan Africa	54
2.17 Conclusions.....	60
Chapter 3: THE LITERATURE ON ZAMBIAN LAND AND AGRICULTURE.....	63
3.1 Zambian Agriculture: National Policy and Trends.....	63
3.1.1 Post-Independence Agricultural Policy (1964-1991).....	63
3.1.2 After the 1991 Elections	64
3.2 National Land Framework.....	66
3.2.1 Pre-Independence.....	66

3.2.2	Land (Conversion of Titles) Act (1975)	67
3.2.3	Other Land Legislation	68
3.2.4	The Lands Act (1995)	69
3.2.5	Summary	71
3.3	Southern Province and the Study Area (Monze and Mazabuka Districts)	71
3.3.1	Profile of farming in Southern Province	73
3.3.1.1	<i>Agrarian structure</i>	73
3.3.1.2	<i>Crops, assets, inputs, and preferences nation-wide and in Southern Province</i>	77
3.3.2	Customary Land Tenure	80
3.3.2.1	<i>Zambia in general</i>	80
3.3.2.2	<i>Tonga Land Law</i>	81
3.3.2.3	<i>Conclusion on customary tenure in Southern Province</i>	85
3.3.3	Settlement Schemes	85
3.3.3.1	<i>Settlement Schemes and National Policy</i>	86
3.3.3.2	<i>Objectives of Settlement Schemes</i>	86
3.3.3.3	<i>Southern Province Settlement Schemes</i>	88
3.3.3.4	<i>Selection of Settlers</i>	89
3.3.3.5	<i>Terms of Settlement</i>	90
3.3.3.6	<i>Land Tenure on the Settlements</i>	90
3.3.3.7	<i>Results of Settlement Schemes</i>	92
3.3.3.8	<i>Settlements surveyed for this study</i>	93
3.3.4	Land Problems in Southern Province	93
3.3.4.1	<i>Problems with Customary Tenure and Inaccessibility of State Land</i>	94
3.3.4.2	<i>Insecurity and Farming Pre-Conditions</i>	95
3.3.4.3	<i>Bequeathment and Farm Development</i>	95
3.3.4.4	<i>Social Sanctions Against Accumulation</i>	96
3.3.4.5	<i>Conclusion on Land Problems in Southern Province</i>	97
3.4	Previous Zambia Land and Agriculture Studies	97
3.4.1	Settlement Farming Methods: Mbulo (1983)	97
3.4.2	Land Tenure and Agricultural Development in Customary Areas: Eastern and Southern Province (Place et al. 1995)	100
3.4.3	Adjusting to Structural Adjustment and other Shocks (Bangwe 1997, Waller 1997)	104
3.4.4	Role of cattle and fertiliser: Deininger and Olinto (2000)	107
3.4.5	Evolving Land Rights, Field Scattering, and Investment in Northern and Southern Provinces (Sjaastad 1998)	107
3.4.6	Unequal Access to Land (Zulu et al. 2000)	109
3.4.7	Conclusions	110
Chapter 4:	METHODOLOGY	112
4.1	Objectives	112
4.2	General Methodological Approach	113
4.3	Conceptual framework	116
4.4	Research Design	123
4.4.1	Types and Sources of Data	123
4.4.2	Questionnaire Pre-Testing	123

4.4.3	Translation	124
4.4.4	Sampling and Response Rate.....	124
4.4.5	Units of Analysis	128
4.4.6	Key Informant Interviews	130
4.5	Fieldwork.....	131
4.5.1	Selection and Training of Enumerators	131
4.5.2	Management of Fieldwork; Quality Control.....	132
4.5.3	Duration of Interviews	132
4.5.4	Problems During Fieldwork.....	132
4.5.5	Seasonality Factors	133
4.6	Analysis	133
4.6.1	Software	133
4.6.2	Statistics	134
4.6.3	Description of the Variables	135
4.6.3.1	<i>Aggregate cost of fixed investments</i>	136
4.6.3.2	<i>Point-scoring system for fixed investments</i>	139
4.6.3.3	<i>Household income</i>	139
4.6.3.4	<i>Household labour force</i>	139
4.6.3.5	<i>HHH's children's educational attainment</i>	140
4.6.3.6	<i>Distance to market</i>	140
4.6.3.7	<i>Index of HHH's parents' endowment</i>	140
Chapter 5:	RESULTS: TENURE SECURITY AND FIXED INVESTMENTS.....	141
5.1	Introduction.....	141
5.1.1	Profile of Sampled Households	141
5.1.2	Respondents' Opinions on Land Rights, Fixed Investment, and Farm Performance	144
5.1.2.1	<i>Observations on Tenure Security and Farm Performance</i>	144
5.1.2.2	<i>Desire for Title</i>	145
5.1.2.3	<i>Observations from customary land holders on titles</i>	146
5.1.2.4	<i>Which Land Rights Are Most Important to Respondents</i>	146
5.1.2.5	<i>Opinions on titles, security, and fixed investment</i>	148
5.1.2.6	<i>Conclusions on Respondents' Opinions on Land Rights</i>	149
5.2	Effects of Tenure Security on Fixed Investments	149
5.2.1	Profile of Fixed Investments per Household.....	150
5.2.1.1	<i>Conclusions on profile of fixed investments per household</i>	153
5.2.2	Differences in Fixed Investments between State and Customary Land.....	153
5.2.2.1	<i>Differences in Quantities of Individual Types of Investment</i>	154
5.2.2.2	<i>Differences in Aggregate Fixed Investments</i>	158
5.2.2.3	<i>Conclusions on Differences in Fixed Investment between State and Customary Land</i>	160
5.2.3	Differences in Fixed Investments across Categories of Land Documentation ..	160
5.2.3.1	<i>Total Investment Across Documentation Categories</i>	161
5.2.3.2	<i>Robustness to Method: Using the Alternative Investment Measurement of Points</i>	163
5.2.3.3	<i>Differences Between Lease-Holders And Title-Holders</i>	163
5.2.3.4	<i>Individual Types Of Investment Across Documentation Categories</i>	164

5.2.3.5	<i>Controlling for the effects of other socio-economic factors on fixed investment</i>	165
5.2.3.6	<i>Examination of the Category of 'No Document, State Land'</i>	171
5.2.3.7	<i>Investment Behaviour Before And After Obtaining Documentation</i>	173
5.2.3.8	<i>Conclusions on Differences in Fixed Investment across Categories of Land Documentation</i>	177
5.2.4	Differences in Fixed Investment According to Modes of Land Acquisition	178
5.2.4.1	<i>Categorisation of Modes of Acquisition</i>	179
5.2.4.2	<i>Fixed Investment by Category of Mode of Acquisition</i>	180
5.2.4.3	<i>Conclusions on Differences in Fixed Investment according to Mode of Acquisition</i>	182
5.2.5	Effects of Perceived Tenure Security on Fixed Investments	182
5.2.5.1	<i>Who has final authority over your land?</i>	183
5.2.5.2	<i>Do you consider tenure status when deciding on fixed investments?</i>	185
5.2.5.3	<i>Want to change tenure status?</i>	185
5.2.5.4	<i>Claimed right to sell land</i>	186
5.2.5.5	<i>Experience of Disputes or Dispossession</i>	188
5.2.5.6	<i>Conclusions on Effect of Perceived Tenure Security on Fixed Investments</i>	191
5.3	Case Studies of High- and Low-Investment Households	191
5.3.1	<i>Highest Quintile of Fixed Investment</i>	191
5.3.2	<i>Lowest Quintile of Fixed Investment</i>	194
5.3.3	<i>Cases of High Investment and Income on Customary Lands</i>	196
5.3.3.1	<i>High Income / Customary Land</i>	196
5.3.3.2	<i>High Investment / Customary Land</i>	198
5.3.4	<i>Conclusions on Case Studies of High- and Low-Investment Households</i>	199
Chapter 6: RESULTS: LAND TENURE AND PRODUCTIVITY, CREDIT USE, INTER-GENERATIONAL TRENDS, ACCESS TO LAND, AND INCOME		200
6.1	Land Tenure and Productivity	200
6.1.1	<i>Differences in Productivity between State and Customary Land</i>	201
6.1.1.1	<i>Maize</i>	201
6.1.1.2	<i>Total crop value per hectare cultivated</i>	201
6.1.2	<i>Full model of factors in maize yields and total crop value</i>	204
6.1.2.1	<i>Land productivity for hybrid and local maize</i>	205
6.1.2.2	<i>Labour Productivity for hybrid and local maize</i>	208
6.1.2.3	<i>Determinants of total crop value per hectare and per unit labour</i>	212
6.1.3	<i>Conclusions on Land Tenure and Productivity</i>	214
6.2	Land Documentation and Credit Use	216
6.2.1	<i>Sources, Terms, and Uses of Credit</i>	217
6.2.2	<i>Respondents' Opinions on Credit</i>	219
6.2.3	<i>Credit Use By Land Documentation Category</i>	220
6.2.4	<i>Other Determinants of Credit Use</i>	222
6.2.5	<i>Conclusions on Land Documentation and Credit Use</i>	225
6.3	Inter-Generational Trends	225
6.3.1	<i>Disposition of Parents' Farmland</i>	225
6.3.2	<i>Children's Educational Attainment</i>	226
6.3.3	<i>Children's Work / Profession</i>	232

6.3.4	Conclusions on Inter-Generational Trends	236
6.4	Access to Land and Determinants of Area Cultivated	236
6.4.1	Respondents' reports on access to land.....	237
6.4.2	Concentration of land and area under cultivation	238
6.4.3	Determinants of area cultivated, proportion cultivated, and crop value per capita	242
6.4.3.1	<i>Crop output value per capita</i>	242
6.4.3.2	<i>Per capita area cultivated</i>	242
6.4.3.3	<i>Total area cultivated and proportion of total farm size cultivated</i>	245
6.4.4	Conclusions on access to land.....	245
6.5	Income.....	247
6.5.1	Components of income per Land Documentation Category	248
6.5.2	Determinants of Income.....	249
6.5.3	Conclusions on Income.....	252
Chapter 7:	CONCLUSIONS	253
7.1	Results with respect to objectives and hypotheses	253
7.2	Policy Implications.....	256
7.3	Contribution to Knowledge and Literature.....	258
7.4	Limitations.....	261
7.5	Future Research Needs.....	262
REFERENCES.....		265
Annex 1:	DETAILS ON CALCULATIONS OF DERIVED VARIABLES.....	273
A-1.1:	Derivation of typical costs of types of fixed investment.....	273
A-1.1.1	WELLS	274
A-1.1.2	FENCING	277
A-1.1.3	PLANTED TREES (WINDBREAK)	278
A-1.1.4	PLANTED TREES (CROPS).....	279
A-1.1.5	DAMS.....	279
A-1.1.6	BOREHOLES.....	281
A-1.1.7	CONCRETE HOUSES:.....	282
A-1.1.8	BURNT-BRICK HOUSES:.....	284
A-1.2:	Point-Scoring System for Fixed Investments.....	285
A-1.3:	Household Income.....	287
A-1.4:	HHH's Children's Educational Attainment	291
A-1.5:	Distance to Market.....	293
A-1.6:	Endowment from Parents	295

Annex 2:	LINEAR REGRESSION RESIDUALS PLOTS.....	297
A-2.1:	Table 6.6, Column 1 (Section 6.1.1.3): Determinants of hybrid maize yields.	297
A-2.2:	Table 6.6, Column 2 (Section 6.1.1.3): Determinants of local maize yields	298
A-2.3:	Table 6.8, Column 1 (Section 6.1.1.4): determinants of labour productivity for hybrid maize.....	299
A-2.4:	Table 6.8, Column 2 (Section 6.1.1.4): determinants of labour productivity for local maize	300
A-2.5:	Table 6.9, Column 1 (Section 6.1.1.5): determinants of total crop value per ha cultivated.....	301
A-2.6:	Table 6.9, Column 2 (Section 6.1.1.5): determinants of total crop value per unit farm labour force	302
A-2.7:	Table 6.19, Column 1 (Section 6.4.3.2): determinants of area cultivated per capita	303
A-2.8:	Table 6.19, Column 2 (Section 6.4.3.2): determinants of area cultivated per capita (customary land only).....	304
A-2.9:	Table 6.23 (Section 6.5.2): determinants of household income per capita.....	305
Annex 3:	SURVEY QUESTIONNAIRE	306

List of Tables

<i>Table 2.1: Intersections of Land Rights with Supply and Demand Effects</i>	39
<i>Table 3.1: Settlement Schemes in Monze and Mazabuka Districts</i>	94
<i>Table 4.1: Number of cost observations for each type of investment</i>	137
<i>Table 5.1: General Characteristics of Sampled Households and Parcels Across Land Documentation Categories</i>	142
<i>Table 5.2: General Characteristics of Sampled Households and Parcels Across Quintiles of Total Household Crop Value (2000/2001 season)</i>	143
<i>Table 5.3: Ranking of Relative Importance of Specific Land Rights</i>	147
<i>Table 5.4: Means and Medians of Amounts per Investment Type over Quintiles of Aggregate Investment</i>	150
<i>Table 5.5: Mean Proportion of Investment Score Contributed by Each Type of Investment, per Quintile</i>	152
<i>Table 5.6: Prevalence and median quantities of fixed investments by type across land documentation categories</i>	165
<i>Table 5.7: Regression results, determinants of fixed investments</i>	169
<i>Table 5.8: Land Documentation Category crossed with Mode of Acquisition</i>	173
<i>Table 5.9: Modes of Acquisition</i>	179
<i>Table 5.10: Modes of Acquisition (Customary sub-sample only)</i>	181
<i>Table 5.11: Frequencies of responses to “Who has final authority over your land?” and median fixed investment per response category</i>	183
<i>Table 5.12: “Who has final authority over your land?” cross-tabulated with Land Documentation Category</i>	184
<i>Table 5.13: Land Documentation Category cross-tabulated with “Do you want to change anything about your tenure status?”</i>	186
<i>Table 5.14: “HHH has right to sell land without chief’s permission?” cross-tabulated with State vs. Customary land</i>	187
<i>Table 5.15: General experience with dispute / dispossession cross-tabulated with Land Documentation Category</i>	190
<i>Table 6.1: Proportion per crop of total area cultivated 2000/01</i>	202
<i>Table 6.2: Difference in mean proportion per crop of total area cultivated (2000/01) between State and customary households</i>	203
<i>Table 6.3: Mean prices received by respondents per crop in 2001</i>	203
<i>Table 6.4: Mean crop value (nominal 2001 Kwacha) per hectare cultivated with that crop</i>	204
<i>Table 6.5: Median yields (hybrid and local maize) and median total crop value per hectare, by land documentation category</i>	204
<i>Table 6.6 Regression results, determinants of hybrid and local maize yields</i>	206
<i>Table 6.7: Median production per farm labour force by Land Documentation Category</i>	209
<i>Table 6.8: Regression results, determinants of labour productivity for hybrid and local maize</i>	210
<i>Table 6.9: Regression Results, Determinants of Total Crop Value per hectare cultivated and per unit farm labour force</i>	213

<i>Table 6.10: Summary of regression results, land and labour productivity</i>	215
<i>Table 6.11: Sources of credit (cumulative, last 5 years)</i>	217
<i>Table 6.12: Type of collateral (cumulative, last 5 years)</i>	218
<i>Table 6.13: What was borrowed (cumulative, last 5 years)</i>	218
<i>Table 6.14: Land Documentation Category cross-tabulated with Credit Use</i>	221
<i>Table 6.15: Regression results, determinants of children's aggregate educational attainment</i>	230
<i>Table 6.16: Respondent observations on land tenure's effects on their children's plans</i>	233
<i>Table 6.17: Land Documentation Category cross-tabulated with 'any full-time farmers' or 'any white-collar workers among working children'</i>	234
<i>Table 6.18: Summary of Gini Coefficients (Total farm size, area cultivated, total crop value, all per capita)</i>	240
<i>Table 6.19: Regression results, determinants of area cultivated per capita</i>	243
<i>Table 6.20: Significant factors of crop value output, per capita area cultivated, total area cultivated, and proportion of total farm size cultivated</i>	246
<i>Table 6.21: Median per capita household income across land documentation categories</i>	248
<i>Table 6.22: Mean (5% trimmed) proportion of revenue per source to total household income, by land documentation category and by tercile of income</i>	248
<i>Table 6.23: Regression results, determinants of HH income per capita</i>	250
<i>Table 7.1: Summary of Hypotheses and Results</i>	254
<i>Table 7.2: Reported Costs of Wells (converted into constant 1995 kwacha)</i>	275
<i>Table 7.3: Descriptive statistics of reported well costs</i>	275
<i>Table 7.4: Reported costs of dams, nominal and constant kwacha</i>	280
<i>Table 7.5: Reported costs of concrete houses, nominal and constant kwacha</i>	282
<i>Table 7.6: Point valuations for types of fixed investment</i>	287
<i>Table 7.7: Mean market prices for produce</i>	288
<i>Table 7.8: Mean input market costs and Food Reserve Agency charges</i>	290

List of figures

<i>Figure 1.1: Map of Southern Province</i>	72
<i>Figure 4.1: Postulated Direct Effects of Land Tenure</i>	119
<i>Figure 4.2: Postulated Indirect Effects of Land Tenure</i>	120
<i>Figure 4.3: Effects of land tenure, with confounding factors added</i>	121
<i>Figure 5.1: Histograms of Aggregate Fixed Investment for State and Customary Sub-samples</i>	159
<i>Figure 5.2: Aggregate Fixed Investment by Land Documentation Category (boxplot)</i>	162
<i>Figure 5.3: Median aggregate fixed investment, title-holders and lease-holders only (histograms)</i>	163
<i>Figure 5.4 Causal model of factors of fixed investment (flow chart)</i>	168

Figure 5.5: Histograms, Number of years of possession pre-change in tenure status and Number of years post-change in tenure status thru 2001	174
Figure 5.6: Annualised Investment pre-change vs. post-change; Total Investment pre-change vs. post-change	175
Figure 5.7: Median Aggregate Fixed Investment by Mode of Acquisition	180
Figure 5.8: Median Aggregate Fixed Investment by Mode of Acquisition (Customary subsample only)	181
Figure 6.1: Scatterplot of Cattle Ownership vs. Hybrid Maize Yields	207
Figure 6.2 Scatterplot, Total value of loans received over last 5 years vs. cattle ownership (both square-rooted)	224
Figure 6.3: HHH's children's educational attainment (aggregate index) by Land Documentation Category	227
Figure 6.4: HHH's children's educational attainment (7 th , 9 th , & 12 th grade completion), Means and Medians by Land Documentation Category	228
Figure 6.5: Lorenz Curve, Concentration among households of Total Value per capita of crops	239
Figure 6.6: Lorenz Curve, Concentration among households of Area Cultivated per capita	239
Figure 6.7: Scatterplot, Total farm size vs. Proportion cultivated of total farm size	241
Figure 6.8: Scatterplot, fixed investment against per capita household income	252
Figure 7.1 Histogram of reported well costs after second eliminations	276
Figure 7.2: Histogram of reported fencing costs after eliminating extremes	278

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Chapter 1: INTRODUCTION

Land, never far from the forefront of debate on sub-Saharan African development, has gained a new prominence in recent years. Much of sub-Saharan Africa (SSA), unlike other developing regions such as Latin America and South Asia, finds itself in the enviable position of a land surplus and/or a relatively equitable distribution of land. Nonetheless, acute redistributive issues stemming from colonial-era concentration of land ownership have confounded governance in Zimbabwe and are a cause for concern in post-apartheid South Africa as well as (to a lesser extent) countries such as Namibia, Botswana, Malawi, and Kenya. Apart from state interventions to redistribute land, there is the lingering intervention of strong state powers over land vis-à-vis private tenure rights. The retreat from socialism in countries such as Zambia, Mozambique, and Angola (combined with post-civil-war resettlement in the latter two) has engendered tenurial debates, as governments and other stakeholders consider to what extent private or community property rights in land (as opposed to state ownership thereof) should be recognised; whether the merits of customary land tenure outweigh its putative disadvantages compared to statutory tenure; and whether the costs and likely iniquities of tenure reform processes are worthwhile. Chronic and apparently worsening problems such as drought and the loss of household labour to HIV/AIDS complicate efforts to address the travails of rural sub-Saharan Africa, and raise the stakes of land reform whilst simultaneously making it difficult for research to isolate the effects of land tenure and distribution from those of such competing phenomena. The need for land research in SSA, to define land reform's place in development strategies and to guide policy, has never been greater.

Because of SSA's prevalent land surplus situation, most research and policy debates have focused on tenurial issues. Land tenure reform has long been seen as a pre-requisite for development in SSA. Most arable land remains under 'customary' tenure, considered by modernisers to be inefficient and in need of reform, usually towards individual freehold systems patterned on Western land law. Neo-classical economic arguments, citing property rights models, propounded tenure security's positive effects on incentives and markets. The historical experience of Western Europe's and North America's freehold systems, and more recent experience in Southeast Asia, suggested that secure individual tenure stimulates agricultural development, and in turn general economic development, with democratisation as an attendant benefit. Africa, it was thought, had better follow suit. Land tenure reform could and should be an instrument of progress, indeed an offensive weapon, against agrarian under-development.

However the replacement of customary with statutory tenure is no longer seen as a magic bullet for rural development and increased agricultural productivity. Major empirical studies in the 1990s failed to confirm the economic model that predicts increased productivity from increased security via greater demand for fixed investments, greater credit supply and demand, and transfer of land to more efficient users. The studies have mainly found that even where tenure security associates with increased fixed investments, the latter do not generally cause increased productivity in turn. Qualitative analyses gave reasons to doubt that putative weak property rights in land are an important constraint on smallholder agriculture in the SSA context. These findings consternate those who espouse property-rights models of economic growth through privatisation, as well as agnostics who had hoped that tenure reform could be a badly-needed offensive weapon against ongoing rural poverty in SSA. The failure of tenure reforms to deliver the promised benefits, indeed their observed negative effects on the poor maintaining access to land, led to a body of opinion that tenure reform, if it is to be done, must take a defensive stance, preserving the frail land rights and livelihoods of poor smallholders against the manipulation of land laws by élites.

The perceived weakness of the case for tenure reform according to the neo-classical model provokes a dual problem, in research and in policy. For research, why does the neo-classical model apparently not work in practice? Is current tenure security (and other aspects of tenure) acceptable for most African farmers, and thus reform is unnecessary? Or can the necessary reforms not be implemented? Has empirical testing to date of links between land rights and productivity really proven the insignificance of tenure security? In short, was the diagnosis wrong, or the prescription, or both?

For policy, what is to be done next? Is there any point in prescriptive models of land tenure, or should tenure reforms merely punctually respond to specific and local problems? Is it still possible that land tenure reform can spur economic growth and poverty reduction, or can it do no more than defend a status quo of poor livelihoods? Since the agrarian situation in SSA remains unacceptably poor, is there no scope for tenure reform to go back on the offensive?

This thesis, drawing on original data from a study area in Zambia, presents findings that test whether fixed investments, credit use, and productivity increase with tenure security among small and medium-sized farmers, and whether other socio-economic effects of tenure can be identified. Thereby the thesis suggests policy and research implications in these ongoing debates. The methods of this thesis were designed to overcome various identified shortcomings in methods of previous studies. For example, the study area was chosen on the basis of having a broad spectrum of tenure statuses (customary tenure, 14- and 99-year

statutory leases, and an assortment of other arrangements) in close confines that allow such variables as terrain quality, weather, and market access to be held (arguably) constant. The key intermediate outcome of fixed investments was measured in a way that allows different types of investment to be aggregated, thus producing an aggregate investment score for each respondent household, and for the overall sample a numerically continuous variable, that could then be compared to outcomes such as productivity and income. The role of farming activities apart from field cultivation, especially livestock, is explored. Also, following the best practice of previous studies, qualitative and attitudinal data were gathered and integrated so as to keep the analyses and conclusions well grounded in the context and reality of the study area.

The concept of land reform is as much a policy subject as an academic one, and discussions draw on inter-disciplinary perspectives. The thesis is more policy-oriented than theoretical, but it necessarily refers to the theories that (for a period) drove policy. The question of whether economic growth from tenure reform can still be considered a feasible goal is beyond the scope of this work; however it is intended to suggest lines of inquiry by which such a broader question can be addressed. To put it another way, since the verdict on that question so far in SSA has largely been negative, a positive finding from this investigation would suggest that the possibility is still open.

The thesis begins with a review of the empirical and theoretical literature on the effectiveness of African land tenure reform (Chapter 2) in order to chart the current policy and research frontiers on the subject. A separate chapter (3) reviews land and agricultural literature on Zambia, in order to place the research for this thesis in a specific historical and cultural context. Research methods are discussed in Chapter 4, followed by results in Chapters 5 and 6. A concluding chapter revisits key findings with reference to the current state of land tenure research.

Chapter 2: THE LITERATURE ON LAND TENURE REFORM IN AFRICA

The objectives of this chapter are to review the debate on sub-Saharan African land tenure reform, assess the empirical evidence to date, critique the neo-classical model that links tenure security to greater productivity, and suggest how the debate and future research might progress. The discussion encompasses *inter alia* the links between redistributive reform and tenure reform; perspectives from anthropology and institutional economics; definitions and disaggregations of tenure security; and considerations of technology, governance, and power. The discussion will show that empirical and deductive research has undermined an old orthodoxy that held the ‘modernisation’ of customary land regimes to be a necessary part of development strategies in SSA. However this deepening appreciation of the complex reality of land issues, and of the fact that such reality cannot be captured in a simple prescriptive model, has not resulted in a clear consensus on what is to be done next in either policy or research.

2.1 Land Reform, Agrarian Transformation and Development

Land reform has long been considered to have a major place in the repertoire of policies used to achieve economic and political development. A body of literature from the 1950s and the beliefs of concurrent development practitioners (summarised in El-Ghonemy, 1990) held that land reform is central to and perhaps a pre-requisite for development. Economically, land reform was believed to foster development by means of its perceived ability to stimulate agricultural productivity to the point of producing an agricultural surplus which would then provide domestic credit mobilisation to support industrialisation (as well as rural poverty alleviation). Politically, land reform was believed to foster democratisation, by de-linking access to land from political power (especially important in agrarian countries where land was the prime means of production), and by reducing concentration of wealth and ownership of means of production—i.e., by ‘de-feudalisation’ of the economy and polity. In the US post-war occupation of Japan, such redistributive land reform was imposed by the military occupiers specifically in order to achieve political transformation: Japan was already substantially industrialised, so the economic rationale for land reform was secondary. Following Japan, redistributive land reforms were implemented in South Korea and Taiwan (in all three cases, Cold War geopolitical competition seems to have been a motive, aiming to both stimulate the economies of and relieve rural inequities in these US-backed polities with a large Communist neighbour.) These land reforms are also frequently linked to the three countries’ subsequent industrial success. Although most post-independence African governments have enacted land reform laws of various types, there has not been a case of land reform in an African country that is as widely considered to be successful, and to have been

the foundation for subsequent capitalist development and democratisation, as those of Japan, South Korea and Taiwan.

2.2 Redistributive Reform and its Links with Tenure Reform

Land reform comprises redistributive reforms and tenure reforms, which although linked are conceptually and practically distinct, and address different problems. A polity may implement both at once, or the two in sequence; but the need for one does not automatically imply the need for the other. This thesis concerns tenure reform, but first, because of the prominence of redistributive issues in discussions of land reform, it summarises redistributive reform and some of its issues relevant to tenure reform.

In most of sub-Saharan Africa, redistributive reform has not been as high a priority as it has in other regions such as South Asia and Latin America. The main reasons are that (a) many African countries are in a land-surplus situation, with a consequently low incidence of landlessness or insecure tenancy¹; and (b) the post-colonial situation in most SSA countries did not leave a class of large landowners with concentrated ownership of good land. However, southern Africa and parts of East Africa are exceptions. Heavy European settlement in South Africa, Zimbabwe, and Kenya (and to a lesser extent in Zambia, Malawi, Botswana, Namibia, Angola, and Mozambique) concentrated ownership of relatively scarce good-quality land in these dryland zones in the hands of settler minorities, a situation that persisted in some countries after independence (or after majority rule in South Africa and Zimbabwe). Because large-scale commercial farming of staple and cash crops is central to the economies of Kenya and Zimbabwe, and important to that of South Africa, past redistributive reforms and proposals for new redistributions have been examined closely for their possible consequences on aggregate production, paralleling the general debate on the feasibility and desirability of redistribution.

The arguments in favour of land redistribution point to two major goals: equity and efficiency. The equity argument contends in a straightforward normative way that increasing the productive assets of the poor, if necessary at the expense of those in whom land ownership is concentrated,² is desirable in order to increase the incomes and welfare of the beneficiaries.

¹ Although Peters (2004) argues that the period in which this possibly complacent generalisation may have been true is ending, and that the increasing competition for land both reflects and fuels deepening social divisions and class formation.

² Such zero-sum necessity can be mostly avoided, it has been argued, by redistribution that takes the form of willing buyer-seller transactions ("negotiated land reform," per Deininger 1999), with the poor receiving external subsidies for land acquisition, or the state acquiring land on their behalf. The capability of this approach to attain the necessary degree of redistribution in South Africa, for one, has been questioned (Lahiff, 2001).

The efficiency argument suggests that redistribution need not incur a loss of aggregate output, indeed that it is necessary in order to increase output, because the agricultural sector may be more efficient after land redistribution. The efficiency argument therefore goes against a line of reasoning of development strategy (often credited to Kuznets, 1955) that holds that inequality, or concentration of productive assets, tends to result in faster output growth than more equitable distribution, mainly because of putative economies of scale. Such reasoning, in the agricultural sector, would generally hold that breaking up and redistributing large commercial farms will reduce aggregate farming output. By contrast, the efficiency argument for land redistribution predicts that losses will be avoided, and indeed gains will occur, because of the postulated inverse farm-size/productivity ratio (holding that small farms are more productive per unit area, and in some versions per unit labour, than large farms). Reasons for this, where it occurs, would include: (a) better management, because of owner/user incentives; (b) reduced supervisory costs of agricultural labour (the presumption being that ‘family’ labour on small farms costs less to supervise, or is more productive with a given level of supervision, than wage labour on large farms); (c) the lower proportion of land on small farms that goes uncultivated; (d) different cropping or farming patterns, for instance the use of more appropriate, often local varieties rather than exotic cash crops; and (e) substitution of putatively abundant and cheap labour for scarce and expensive capital.³

Major studies have propounded empirical confirmation of the postulated inverse ratio (including, among many others, Berry and Cline 1979 and Cornia 1985, with a more recent reiteration by Griffin et al. 2002). Regarding the SSA context, Deininger and May (1999) and Deininger et al. (2000) conclude from empirical evidence in Zimbabwe and South Africa that growth with equity in the farming sector is possible. Deininger et al. (2000) further state that economic theory is now clear that a one-off redistribution of assets can permanently enhance growth, and (citing cross-country regressions) that unequal distribution of land ownership produces lower growth than would occur if land ownership were equalised. Moreover, large farms may not be as efficient as they seem: “The economic performance of commercial farms in these [*African*] countries has often been dependent on structures of government support for research, extension, credit, inputs and access to markets, which assured them a preferential position. Once changes to these policies had been brought in, following Independence, the strong economic performance of these farms was shown to be more apparent than real.” (Toulmin and Quan, 2000a: 23) Like businesses with unhealthy close links to government, it appears that large farms can use politics to attract inputs (such as water) at below-market prices, thus reinforcing their dominant productivity and creating the illusion of efficiency and

³ Large labour/capital ratios could also owe to less positive reasons: for instance, inordinate labour input in an effort to compensate for inadequate available land.

economies of scale. Letting markets operate freely to get the factor prices right, the reasoning goes, would dissolve large farms' apparent advantage.

Note, however, that to the extent such gamesmanship occurs, it implies that the small farmers who would replace large commercial farms will have to enjoy some of the same access to inputs and markets, as well as economies of scale (if they exist), if they are to replicate large-farm productivity—unless it is believed that the substitution of cheap labour for scarce capital is sufficient to bring about the inverse ratio effect. Also, if certain land tenure systems have been conducive to large-farm investment demand and supply that in turn stimulated productivity, then this implies that the tenure system for beneficiaries of redistributive land reform must be similarly conducive if large-farm productivity is to be replicated. This is one link between redistributive reform and tenure reform: constituting new smaller farms under weaker tenure security than was enjoyed by the large farms from which they were formed will harm productivity to the extent that tenure insecurity impairs productivity.

A corollary to that link concerns inter-generational transmission. The argument is frequently made (for example, in Bruce 1982) that family labour is better motivated than hired labour, and that there is greater investment demand when the offspring stand to inherit the farm. Redistribution that does not provide for secure bequeathment, even if it does provide for durable single-generation tenure (e.g. under long-term but non-heritable lease), can therefore be expected to produce farms with less incentive for fixed investment than would have been the case with secure bequeathment that leads to inter-generational farms.

The evidence and arguments for the inverse ratio have been challenged. Breaking up large farms that tend to be more capitalised, more mechanised, more accustomed to higher-value crops, to have better access to input and output markets, to have more professional managers, and to enjoy economies of scale, may harm aggregate production without necessarily yielding better income for the beneficiaries of redistribution. The evidence for the inverse ratio is found by some (including Sender and Johnston 2004, Dyer 2004) to be unconvincing or even non-existent. Some of the major studies claiming to demonstrate the inverse relationship exhibit key methodological problems such as exclusion of very large and very small farms from many samples; this allowed the possibility of an undetected non-linear or S-shaped relationship (for example, medium-sized farms may be less efficient than small farms, more efficient than very small farms, and much less efficient than very large farms) (Dyer 2004). The critics have also noted the lack of consideration of possible adverse selection (for example the possibility that some farms are necessarily large because they are situated on relatively unproductive terrain). Furthermore, to the extent (limited, according to these critics) that the inverse ratio has been reliably identified, it is still inadequately explained: the usual

explanation of small farms' avoiding the costs of labour supervision by using family labour has theoretical and empirical weaknesses (Sender and Johnston 2004). There is also a likelihood that inputs of family labour on the smallest parcels are likely to be made on the basis of poverty, unemployment, intra-household coercion, and other involuntary reasons, not leisure preference or optimal factor substitution (Dyer 2004). Generally, it may be inadequate in theoretical and epistemological terms to test the inverse relationship by means of static cross-sectional comparisons rather than dynamic political economy approaches (Dyer 2004). Lastly, to the extent that proponents of redistribution implicitly envisage an equitable and productive small farm sector in an equilibrium state, the persistence of class formation dynamics gives reason to suspect that such a sector, even if achieved, will not be stable.

Some objections are also aimed at the presumption of pro-equity effects of land redistribution, as well as the postulate of resultant efficiency gains at the aggregate level. Wage employment on large farms can be a vital source of income for the rural poor (especially for the landless, who are often the poorest); opportunities for such employment are unlikely to be replicated on smaller farms following redistribution, particularly given the low level of state support for the agricultural sector that governments such as those in Zimbabwe and South Africa appear to contemplate (Sender and Johnston 1995, Sender and Johnston 2004). Redistribution programmes typically do not disaggregate the 'household' and therefore skew the benefits (i.e. land rights, and therefore the intra-household share of the income) towards privileged groups within the household like the male gender, as well as excluding altogether most female-headed households from redistribution (Sender and Johnston 2004).⁴ Such disunity of interests and unequal access to resources within the 'household' are also likely to impair the productivity of farms benefiting from redistribution, further attenuating the postulated inverse ratio effect. Here, therefore, is another link between redistribution and tenure reform: both equity and efficiency gains, if any, from redistribution are likely to be dulled or annulled in situations where women's unequal access to land (and, by extension, unequal access to agricultural inputs and control over outputs) is unremedied.

Can tenure reform cause redistribution? It could do so by enabling or stimulating land transfer markets. The literature abounds with arguments and examples of how this tends to produce increasing concentration of land (see Section 2.11 below); yet the reverse can be imagined. A situation where landholders wish to divest themselves of part of their (possibly excessive) holdings, but are precluded from doing so, for example by a ban on land sales or on sale of their type of holding, or a ban on renting out, might see transfers of land from the large holder

⁴ See Section 2.16 below for a discussion of gendered land rights and problems with the concept of the unitary household.

to smaller holders were these bans removed. For example, a farmer with long leasehold on a 100-hectare resettlement parcel may find that it is no longer feasible to farm all 100 ha (perhaps due to changes in factor and output prices, or changes in availability of inputs or family labour). A system that precludes selling the lease, selling part of the parcel, or renting part of the parcel leaves the farmer little choice but to stay on the land despite under-utilisation. Changes in the rules might, in one way or another, bring the surplus land onto the market. (Experience suggests that farmers and communities in this situation find practical ways to adjust their land holdings irrespective of statutory requirements and restrictions, such as *sub rosa* rental.) Another example of tenure reform that can produce redistribution is lowering of administrative barriers to land acquisition (e.g. cost, delay, knowledge). A further example is extension of land rights to under-privileged sub-populations, most obviously women.

The long-standing debate on the equity and efficiency of redistributive reforms cannot be presented in the detail it deserves, as a major component of developmental discourse, within the scope of this empirical study on tenure reform in sub-Saharan Africa. What emerges from this brief review is that there are points of linkage between redistributive and tenurial reform: the fact that redistribution involves decisions on the tenurial terms for beneficiaries; the possible role of tenure reform in enhancing the productivity of small farms, which in turn influences the debate on the putative efficiency gains from redistribution; the need to consider under-privileged groups such as women in both tenure and redistribution; and the fact that some types of tenure reform can cause or at least enable a degree of redistribution.

2.3 Tenure Reform

Whereas redistributional land reform has been seen as a pre-requisite to equitable development in other regions, tenure reform has been considered to be the key in sub-Saharan Africa (SSA). Most arable land in Africa remains under ‘customary’ tenure arrangements which (starting in colonial times) were assumed to be inefficient and in need of reform, usually towards individual freehold systems patterned on Western land law. Early arguments for reform of customary tenure were typified by the 1953 Swynnerton Report (cited in Berry 1993, among others) on the rural economy of Kenya, which argued that the conversion of tenure rules for African farmers from customary arrangements to Western-style freehold title would achieve political and economic transformation, creating a class of ‘yeoman farmers’ who would be more productive and amenable to modernisation. The argument was thus explicitly political and cultural as well as economic. Similar arguments were heard from French colonial governments in Africa (e.g. Senegal, as described by Golan, 1994).

After Independence, arguments for land tenure reform were more exclusively economic, based on a neo-classical model of the benefits of property rights in land for individual farm productivity and aggregate agricultural production. This strong if simple model predicts greater productivity as land tenure becomes more secure and individualised, via three effects:

1. The farmer will have more incentive to make long-term investments or improvements in her or his land that boost land productivity, reduce yield variability, reduce necessary labour input, or sustain or conserve the land (greater *investment demand*).
2. The farmer will be able to obtain credit, or greater amounts of credit, because of the ability to offer the land as collateral (greater *credit supply*).
3. Land markets will operate, transferring productive land from less efficient to more efficient users through willing transactions (leading to greater *aggregate production*).

And conversely, in a situation of insecure tenure, the farmer would have less incentive to bother with fixed improvements or sustainable use; s/he would have no land collateral to offer for credit and thus would suffer diminished access to credit; and inert land markets would not permit efficient producers to expand their holdings.

The diagnosis, then, in both colonial and post-Independence eras, was that customary tenure was insufficiently secure for the individual because it was communal and/or arbitrary. The prescription was the replacement of customary tenure with statutory, documented tenure based on English-style freehold titles, administered by the central government. The economic logic of the model was so taut and seemingly self-evident that few policy-makers closely examined either the diagnosis or the prescription. The largely successful experience of newly-industrialised East Asian countries, whose explosive economic growth in the 1960s and 1970s was preceded by land reforms that featured elements of individual freehold, forestalled argument. The case seemed further proven when the neo-classical model received empirical support from a World Bank study in Thailand (Feder et al., 1988): the study found that, as the model predicts, greater tenure security (in the form of title deeds) did lead to greater land investment, credit access, and productivity. But around the same time, empirical evidence (some anecdotal, some qualitative, and some increasingly rigorous and quantitative) began to mount that something was wrong with titling in Africa. A series of studies testing the model empirically in a variety of African settings found much weaker support for the model than the results from Thailand. Which, then, was wrong—the diagnosis (insecurity of customary tenure), the prescription (titling), or both?

2.4 Assessing the Evidence on African Land Tenure Reform

The central piece of empirical testing of the neo-classical model in SSA is Bruce and Migot-Adholla (1994), presenting eight country case studies by the World Bank and Land Tenure Center (Madison). As background:

“The large literature on African land tenure did not provide convincing empirical proof of the benefits of land registration programs...But the logic of the economic model was compelling, and it had recently been tested with impressive results in Thailand (Feder et al. 1988). At the same time, there was recognition that a formal title did not necessarily mean an increase in tenure security...and a substantial body of microstudies, especially from Kenya, raised questions about the effect of title registration programs in African circumstances...” (Bruce et al., 1994: 251)

To operationalise the concept of tenure security for use in surveys, tenure was broken down into bundles of specific rights, categorised descriptively as breadth (or ‘robustness’), duration, and assurance. Breadth of rights covers the variety of rights that the smallholder enjoys, such as use rights and transfer rights; duration refers to the degree of permanence of those rights; and assurance covers likelihood and costs of enforcement of rights.

Reviewing the results, Bruce et al. find that customary systems generally have secure tenure but weak transfer rights. “The World Bank studies confirm that the extent of transfer rights varies considerably, and sought to identify the factors responsible for the variability. They found a correlation between the progression toward ‘full transfer rights’ and population pressure.” (ibid: 253) ⁵ On the statutory side, from the studies in Somalia, Senegal, Uganda, and Kenya, the authors conclude that “Registration under a weak tenure from the state does not provide meaningful security and may, in fact, decrease security of tenure.” (ibid: 257)

The effect of titling on land improvements or fixed investments was found to be mixed. No significant effects were found in Somalia and Senegal, but there were positive and significant effects in Uganda on certain types of improvements, and positive though insignificant effects on other types. In Ghana, a much higher percentage of parcels held with full transfer rights had improvements than parcels with limited transfer rights (61.8 vs. 5.4 per cent) (Bruce et al., 1994: 255).

Does tenure security have a positive effect on farm productivity, via fixed investments or other mechanisms? “We found no significant relationship between land rights and yields in any of our study regions. This result is surprising for Rwanda, where some positive relationships between land rights and productivity-enhancing land improvements were found. The

⁵ This incidentally supports what is called the Evolutionary Theory of Land Rights (see below, Section 2.6), which some (e.g. Platteau, 1996) consider part of the neo-classical economic model.

discrepancy cannot simply be dismissed as the result of noisy yield data, because the results for many other variables included in the regressions were satisfactory, both in terms of statistical significance and expected signs.” (Bruce et al., 1994: 255) The authors speculate that this may be due to the possibility that operators of parcels under short-term use rights apply more intensive labour inputs, “compensating to some extent for the lower levels of yield-improving investments on their land.” (Bruce et al., 1994: 256) There are other possible explanations. First, some of what are termed ‘productivity-enhancing improvements’ may in fact be better characterised as improving sustainability or reducing yields variability; or, they may have purposes other than annual cropping (e.g. livestock, orchards) that contribute to income but not to yields. Second, the producer’s choice may be to use the improvements to maintain yields at constant levels but with diminished labour or other inputs, thus increasing profitability (especially if family labour is valued). This producer choice may make even more sense in a situation of limited access to markets for surplus production, i.e. there may not be much profit in producing, and trying to market, more.

In Kenya there was an apparent correlation between titles and yields, but “when the effects of size and market access are separated out, it becomes clear that it is these factors, rather than title, that are responsible for the correlation.” (Bruce et al., 1994: 258) In other words, large farms with good market access tend to be titled, and also tend to be more productive. Why did titles not directly improve productivity? “The lack of any significant relationship between title and yields may be explained by the limited use of credit in the Kenyan study regions.” (Bruce et al., 1994: 259) And, one suspects, in the other study regions as well: “The use of formal credit in the study regions is limited, reflecting the poor development of formal rural banking institutions. In 9 of the 10 study regions, less than 13 percent of the farms received formal credit during 1987-88 [*including Kenya*]...It is therefore not surprising to find a weak relationship between land rights and the use of formal credit.”⁶

It is equally unsurprising, then, that links between titles and yields are weak. In the neo-classical model, credit is the key causal conduit between tenure security and increased output. Credit can provide for higher-quality and more timely short-term inputs, and (with longer-term credit) fixed or mobile capital investment. Without credit, the only route from tenure security to greater output is through labour-intensive land improvements (which do not require borrowed capital). Tenure security does not theoretically provide more incentive for greater short-term labour inputs (e.g. more intensive hoeing, hand-watering, weeding) than would an insecure situation, because the benefits of such inputs (better harvest) will accrue in a short period within which tenure insecurity is not a consideration (except an extremely insecure

⁶ This compares to over 50% in the Thailand study areas of Feder et al. (1988).

situation where one may be dispossessed before the upcoming harvest). Therefore, without credit, we would not expect to see productivity gains from increased tenure security except via labour-intensive land improvements. (And, it is possible that many of the types of such improvements are more designed to improve the sustainability or ‘defend the yield’ of the farmed land—e.g. anti-erosion constructions—than to increase annual yield. In that case the productivity effect would be even smaller.) So it is a potentially severe criticism of African titling programmes to say not only that productivity gains from tenure security via producer incentives are insignificant in lieu of credit, but also that “The low incidence of formal credit in Kenya...suggests that transformation of land tenure alone will not lead to the development of active rural credit markets.” (Bruce et al., 1994: 254-255)

The authors synthesise some broad conclusions.

“First, in generally depressed conditions of agriculture, as in Senegal, there is no reason to hope that titling will have an effect...Second, giving landholders weak titles constrained by conditions and prohibitions will not have the anticipated incentive effects...Much of the titling demand for smallholders in Africa can be viewed as ‘preemptive’—representing an attempt to prevent the state from allocating the land to someone else, rather than the expression of a felt need for new operating rules of tenure.⁷ Fourth, even in a vital and heavily market-oriented agriculture such as that in Kenya, factors such as farm size and market access may overwhelm titling impacts, especially where land is not used to secure credit and only demand-side, security-induced effects of title are available.” (Bruce et al., 1994: 259)

“A final conclusion, supported by both the LTC and World Bank studies, is that national legislation of tenure reform has a limited capacity to change behavior.” (Bruce et al., 1994: 259) This goes both ways, in that state attempts to prohibit or tightly regulate land markets are likely to be disobeyed when economic and social incentives (and customary activity) impel trading land; and conversely, state attempts to legislate a land market into existence are unlikely to override customary prohibitions against land commoditisation.

Turning to implications for policy, the authors note that the studies they present deal with titling of existing users; whereas in Africa many titling programmes occur in the context of state allocation of land (often unpopulated or ‘under-utilised’) to new users. Titling is understandably important to these users because they are acquiring the lands without customary systems of legitimation. Land-grabbing phenomena often stem from this sort of allocation, with predictable effects on local population welfare and environmental degradation. “Many African states have used titling programs to redistribute land and have done this

⁷ However, one suspects that if any of the African study areas had had the same degree of credit supply as the Thai study areas in Feder et al. (1988), then the smallholders would similarly value title for its effect on access to credit.

unfairly so often that many people question whether the state can be trusted in this role.” (Bruce et al., 1994: 261)

The chief implications for policymakers are that the findings “cast doubt on the wisdom and cost-effectiveness of large-scale, systematic programs of compulsory titling for smallholders in rainfed agriculture; redirect attention to more incremental approaches to change in indigenous tenure systems; and redirect support of titling activities toward efforts focused on localities of particular need. We believe that the task of tenure policy research for the next decade is to elaborate such gradualist approaches, relying to a significant extent on incremental patterns.” (Bruce et al., 1994: 261) Under such gradualist approaches, “We should be moving away from a ‘replacement paradigm,’ in which indigenous tenures are to be replaced by tenure provided by the state, toward an ‘adaptation paradigm’...An adaptation paradigm requires a supportive legal and administrative environment for the evolutionary change in indigenous law.” (Bruce et al., 1994: 261) Costly titling programs

“...may be best used as a capstone on an evolutionary process of tenure change, rather than as an attempt to compel tenure change...The studies suggest that programs of compulsory and systematic titling and registration should be confined to circumstances in which: land has become valuable and is the subject of intense competition and disputes (as in urban and peri-urban areas), and the customary tenure system is failing to cope with the conflicts; or, land is being distributed by the state in connection with a project involving resettlement, and there is no customary tenure system...The normal and financially sound progression for the expansion of registry systems is outward from high value land areas.” (Bruce et al., 1994: 262-263)

Participatory adjudication processes that clearly recognise customary rights will guard against unfair abrogation of land rights. Intra-household equity issues also need to be considered, such as gender discrimination on land rights, and rights of compound members apart from the compound head.

Lastly, “Land tenure is profoundly political, and its control continues to be a critical factor in the development of African polities and economies.” (Bruce et al., 1994: 264) This last conclusion, perhaps a partial retreat from the neo-classical perspective that assumes ideal institutions and evenly-distributed power, echoes a nearly concurrent World Bank paper (Binswanger et al., 1993) which argued (somewhat progressively, considering its source) that power relations outweigh tendencies towards economic efficiency in determining the institutional and economic outcomes of land reform.

What is one to make of Bruce and Migot-Adholla’s findings that tenure security (as defined and measured in their studies) does not have the effect in SSA that the taut neo-classical economic logic predicts? They found that both the diagnosis and the prescription were wrong. Customary tenure is mostly not insecure, communal or arbitrary. Governments were unable or

unwilling to enforce the attributes of titles (like mortgageability, and sometimes mere security) necessary to activate the economic logic. Yet their collection of studies left some puzzles. Why did better security only rarely prompt more fixed investment? Why did fixed investments not improve yields? Is the dearth of mortgaging a problem only of credit supply, or also of demand? Is tenure security actually unimportant to African farmers, or are they mostly satisfied with the security of their tenure? What do other studies say about diagnoses and prescriptions? Apart from empirical findings such as those of Bruce and Migot-Adholla, were there deductive reasons to think that the neo-classical model would not operate in the SSA setting?

2.5 Multiple Meanings of Land

One school of thought holds that material analysis of African land will always be incomplete, and people will not always act as economic models predict, because land has non-economic meanings and uses. “Contemporary discussions of land-holding in Africa seek to integrate three perspectives, among others: the political, the economic, and the cultural. At the simplest, this triangulation means bearing three kinds of human ambitions in mind—power, wealth, and meaning—and looking for the linkages between them.” (Shipton and Goheen, 1992: 307)

Different disciplines and paradigms condition analyses and conclusions. The anthropological approach is not constrained to make the broad assumptions (i.e. simplifications) necessary for the quantitative analysis favoured by neo-classical economics, and thus can describe land and society in finer detail. (Some might argue that freedom from such assumptions limits the discipline’s ability to make predictive models.) Berry (1993) promotes the centrality of cultural perspectives for substantial as well as methodological reasons:

“In both neo-classical and Marxist theory, culture—like power—is treated as exogenous or subordinate to economic systems and processes...[M]ost other contributors to the literature on interlinked transactions mention the work of anthropologists who emphasize the fluidity of institutions or the multiple and contested nature of meanings associated with exchanges or claims on productive resources...Economists who have noted the fact of negotiability in African economic life tend to assume that its effects on economic efficiency and progress are negative...Negotiability is not just an inconvenience for foreign investors, but a pervasive feature of social and economic processes which calls for reconceptualization rather than for conditionality. In rethinking African agrarian change, we need to begin with historical and anthropological literature which represents law as social process, transactions as subject to multiple meanings, and exchange as open-ended and multidimensional rather than single-stranded and definitive...Culture and politics neither imitate nor distort economic activity; all three are interrelated dimensions of social processes...If rules, transactions and values are ambiguous and negotiable, then economic activity cannot necessarily be explained in terms of decisive choices or effort to gain exclusive control over goods and resources...Rather, I will argue, they [*economic behaviours*] reflect people’s efforts to keep their options open and to mobilize potential allies and supporters.” (Berry, 1993: 12-14)

Berry argues that the colonial imposition of indirect rule (with its consequent reconfiguration or fabrication of customary polities) caused the diversion of resources from directly productive investment to political-economic tools: “Indirect rule affected the management of resources not by preserving communal property rights, with their attendant problem of ‘free riders’...but by assigning property rights to social groups whose structures were subject to perennial contest...Farmers didn’t squander their patrimony because they figured they could get away with it, but they did often find it advisable to invest part of any available surplus in the means of contesting access to resources, leaving less for investment in directly productive capital.” (Berry, 1993: 42)⁸ This is essentially a transaction costs argument—farmers having to spend resources to assure fair political outcomes—and presages a possibility raised by Deininger et al. (2003), that fixed investments made with the intention, or out of the necessity, of strengthening tenure security (as they found to be the case in Ethiopia, discussed below) may be productively sub-optimal.

Ambiguity in land rights, a potentially healthy part of social systems, was distorted by colonial attempts to codify ‘customary law.’ “...[A] growing body of literature has shown that ‘customary’ laws were not static perpetuations of precolonial norms, but new systems of law and adjudication based on colonial administrators’ interpretation of African tradition...” (Berry, 1993: 23-24) Codification, although intended to rigidify customary practice, introduced new dimensions of contestation of meaning and authority, thereby having the unintended effect of enhancing the fluidity of customary practice. Colonial administrations hired anthropologists to sort out what exactly was pre-existing tradition, but informants could be disingenuous, considering what was at stake. “Multiple and conflicting testimonies were more likely to be dismissed as evidence of Africans’ venality or obtuseness, however, than examined for the possibility that the homogenous systems of primordial law and culture which officials had painstakingly pieced together to serve as the basis of the colonial order may never have existed in the first place...Struggles over the meaning of traditional rules and structures of authority shaped struggles over resources, and vice versa...” (Berry, 1993: 31-32) “The significance of ambiguous land rights for agrarian change in Africa is not so much that land rights are insecure and that land use, therefore, is inefficient, but that people’s access to land depends on their participation in processes of interpretation and adjudication, as well as on their ability to pay.” (Berry, 1993: 104) And, putting it another way: “Since pre-colonial

⁸ Such a phenomenon is hardly confined to rural Africa: business people in industrialised countries commonly donate simultaneously to competing political parties, as well as to charities and business clubs; and indeed what is keeping lawyers on staff or retainer if not investing in the means of contesting? Such investments would however be more onerous to those with lower incomes. This implies another economic argument in favour of modifying tenure regimes in a way that allows a producer to invest less in the political means of safeguarding ownership, and more in production.

times, African farmers have gained access to productive resources both through market transactions and through social relationships.” (Berry, 1993: 16)

African customary tenure arrangements which economists consider too ambiguous (i.e. insecure or undefined) to be efficient may have the advantage of equity. “In agricultural societies nearly everywhere across Africa, unevenly distributed rights in land are adjusted by an infinity of arrangements, often *ad hoc* and sometimes unnamed, for seasonal or longer-term transfers that may include *land loans*, *entrustments*, or *share contracts*. These arrangements are not necessarily ‘market’ transactions and may not be based on money.” (Shipton and Goheen, 1992: 311-312) Secondary or derived rights, another means of fine-tuning equity, are also important in rural settings, and are usually too complicated to be captured or honoured in formal land codes (Platteau, 2000: 66) Equity is as much an economic concept as efficiency or productivity, and equally amenable to quantitative measurement; so it would be untrue, as well as a romanticisation, to say that customary tenure’s equity functions are anti-economic.

Cultural factors can also impinge on what might seem economically rational behaviour. Low demand for fixed investment, and for the credit to finance it, can stem from aversion to wealth accumulation, which may be discouraged by social factors like envy. “[*Failure to demand credit for use in land improvements*] may also happen when the required infrastructure, input-delivery, output-marketing or extension services are not available...or when visible wealth is being arbitrarily taxed (a risk to which agricultural investments are particularly vulnerable); or when more entrepreneurial farmers are discouraged from improving their land and accumulating capital because this stirs up jealousy amongst the other villagers...” (Platteau, 2000: 59) In addition to envy, macro-economic instability may make it rational to invest capital in mobile or liquid assets rather than fixed improvements, irrespective of tenure security. Livestock are an obvious option (especially as they can be spread out among relatives’ herds so as to hide wealth), as are short-term inputs for intensification (like chemical fertiliser). A landholder with surplus hectareage may also rent it out (for cash or for vaguer considerations such as labour or prestige) rather than take the business risk of cultivating or improving it. African farming offers plenty of economically rational and socially sensitive alternatives to accumulation of fixed investments.

2.6 A Related Model: the Evolutionary Theory of Land Rights

A cousin to the neo-classical model is the Evolutionary Theory of Land Rights (‘ETLR’). ‘Evolutionary’ refers to the hypothesis that land tenure will evolve towards individualisation and security in situations of increasing population density, commercialisation, or changes in relative factor prices. “The basic position of the evolutionary theory of land rights is that as

land scarcity increases, people demand greater tenure security.” (Platteau, 2000: 52) In some versions, it also predicts a ‘supply’ response to such demand, in the form of new institutional arrangements or interventions, perhaps devised by customary institutions, or else advanced by supra-local institutions such as national states if customary ones are unable to provide them. The neo-classical model is micro-economic and macro-economic, in that it takes land tenure rules or status as an exogenous, independent variable. By contrast, the ETLR is institutional (and indeed is associated with New Institutionalism) in that it explains changes in rules as an endogenous variable.

A distinction between the neo-classical model and the ETLR is that the former yields a plain policy prescription: strengthen tenure security if you want a more productive agricultural sector. The ETLR by contrast is more neutrally descriptive: it predicts that demand for increased tenure security will arise spontaneously in certain demographic and economic circumstances (and that institutions will evolve to meet this demand). The ETLR should not be held in competition with the neo-classical model, because the two are not predicting or explaining the same phenomena. The NCM predicts economic outcomes from institutional factors (broad, durable and assured property rights). The ETLR predicts institutional outcomes from institutional, demographic and economic factors. (As this study is concerned with means of achieving rural development and poverty alleviation, it will spend more time reviewing critiques of the neo-classical model and its policy prescription.)

If the ETLR is looked to for policy prescriptions in the same way that the NCM has been, it might be read to say ‘leave well enough alone’ – institutions will respond to the demand. Also, empirical testing of the ETLR is likely never to render a clear-cut verdict: parts of the theory will be shown to operate in some locales, others not to do so. Sjaastad (1998) tested most components of the ETLR empirically with data from Zambia’s Northern Province, and found some support in the data for many of them. Berry (1993), by contrast, finds little empirical support for the ETLR, arguing that its tendencies are trumped by proliferating social networks: “...in our case studies [*Ghana, Nigeria, Kenya, and Zambia*], even when transactions in land rights have become thoroughly commercialized, they have remained tied to social identities, and claims on particular pieces of land have proliferated over time, rather than converging towards private ownership.” (Berry, 1993: 119) In policy terms, therefore, the ETLR may be most useful as a caveat against prescriptive models that recommend the imposition of institutional solutions, such as titling, that spur the pre-emption of evolving institutions.

2.7 Land is not the scarce factor of production

Contest over land is only likely (or rational) if land is scarce, or if it requires complementary fixed investment of scarce inputs (including labour) to make it productive. The constraint on enhanced agricultural production in Africa may not be capital or land, but labour. Mobilising agricultural labour for small and large landholders alike depends on power as well as economic relations, and the erosion of traditional polities and emergence of off-farm wage opportunities (such as in mining) can cause a perennial farm labour shortage:

“Specifically, while access to land has remained linked to membership in social networks, farmers’ ability to mobilize labor through such networks has declined. Consequently, for the great majority of African farmers, access to labor has been more vulnerable to the unevenness of commercialization and the constraints of poverty than access to land. This, in turn, helps to explain why, despite widespread poverty and underemployment, the agrarian question in Africa turns on scarcity of labor rather than land...” (Berry, 1993: 101)

It stands to reason that in land-surplus countries with largely un-mechanised agriculture, labour rather than land is the scarce factor of production. The neo-classical model by contrast assumes that, once tenure security has mobilised capital, the labour market will take care of itself: labour will be attracted to wherever the wages are. If Berry is right, however, then the productivity gains from tenure security would be dulled in the absence of capital for mechanisation to replace scarce labour.

Farmers may also be deterred by macro-economic instability or caprice (for example, macro-economic policy that determines factor and product prices), irrespective of tenure issues. “Under unstable economic and political conditions, farmers are reluctant to tie up land, labor, and capital in long-term projects, such as soil conservation, water control, or fixed capital formation, which may sustain soil fertility or augment available land and labor. Instead, they are likely to spend more time in off-farm employment or out-migration, both of which accentuate the trend toward smaller farming units and investment in liquid assets.” (Berry, 1993: 195) One notes that another rational response is to accumulate mobile and liquid assets (such as livestock), or to use short-term means of boosting production (like chemical fertilisers) rather than long-term fixed improvements. If this is right, then in a country with excellent tenure security but poor macro-economic stability, we would expect to see little or no effect of tenure security on fixed investment: tying up scarce resources is too risky, and short-term alternatives exist.

A corollary of the possibility that land is not the scarce factor of production is that analysis should not consider staple crop yields (i.e. land productivity) as the only outcome of interest. Productivity always makes the most sense when it refers to the scarce input. Analysis that uses

productivity per unit land as the dependent variable, especially in a land-surplus area, is bound to miss other important dimensions of productivity.

2.8 Mis-diagnosis of insecurity or communality of customary tenure

This set of critiques argues that customary tenure is neither communal (insufficiently individualised) nor insecure, and therefore the diagnosis that yields the prescription of titling is mistaken.

Mis-characterisations of African customary tenure have a long and inglorious history; fortunately, challenges to them also started early. In a Zambian example, White (1963), the colonial government's Land Tenure Officer, went out of his way to debunk what he saw as myths about the communal and non-commoditised nature of African land tenure:

“Specific land rights are acquired and exercised by individuals. Such land rights are attributes of persons, and they emerge as individualistic rights, except in the limited cases where some element of lineage land holding is present. These cases are rare because there are few areas where the villages in which individuals live are predominantly unilinear groups. Consequently in general the sum total of rights which make up the features of African land-tenure in Northern Rhodesia can only be regarded as equivalent to individual tenure.” (White, 1963: 364)

He also documents that land transfers occurred, temporary and permanent, with or without consideration (immediate or deferred, cash or non-cash though more often the latter), and therefore avers that “The conception that Africans do not sell land cannot in my view be sustained.” (White, 1963: 365)

‘Customary’ perhaps should be kept in inverted commas because closer examination, as by Berry (1993), indicates that custom is often not what it seems but is more recently invented, or badly misinterpreted. Berry argues that the ‘communal’ nature of ‘customary’ African land ownership was in large part imagined or wilfully fabricated by colonial administrators, in part because chiefs would have stronger rights under communal systems, which was convenient for the purposes of indirect rule. (Berry, 1993: 105) Chanock (1991) points out two ways in which the (wilful) mis-characterisation of African customary tenure as communal and arbitrary was convenient for the broader colonial project. First, if Africans did not really consider that they own their land, who could object to their relocation (i.e. dispossession)? ‘Insecure’ tenure took the sting out of land seizures. Second, the idea that African societies had not evolved the institution of private property was a powerful ideological criticism of their ‘backwardness,’ and justified paternalistic colonial policies.

‘Customary systems’ may falsely imply something traditional or ancient. One of the starker illustrations of this is the former South African Bantustans, where land rules were called

‘customary’ by politicians wishing to enhance their legitimacy, whereas they were, although locally governed, clearly an outgrowth of a recent situation of domination. Furthermore, ‘customary vs. formal’ may be a false dichotomy: local (‘customary’) practices have for a long time incorporated statutory concepts, so they are already hybridised and “do not follow a linear progression from ‘traditional’ to ‘modern.’” (Delville, 2000: 102)

Customary law can adapt quickly to exogenous changes. Woodhouse et al. (2001) present studies from areas of Mali, South Africa, Kenya and Botswana each featuring a well-watered enclave in surrounding drylands. Some of the wetland enclaves were new, as in Mali, where a dam in neighbouring Burkina Faso partially flooded lands upstream. In that case, the customary regime was able to adapt quickly to the new opportunities for rice cultivation (previously unknown to that region) that the flooding afforded, taking into account the specific agronomics of riziculture, the ecology of seasonal flooding as regulated by dam management, and the effects of these on farmer incentives. There was nothing primordial about these tenure arrangements, indicating that customary tenure in Africa can be fluid, dynamic, and swiftly responsive to changes in technology, demographics, ecology, and politics.

The mis-characterisation of African tenure as communal had serious consequences for economic analysis and resulting policy prescriptions. The misappraisal was on two levels: first, it implied that land farmed by the individual was not securely and individually held, thus ruining individual incentives as well as credit supply; second, that common land was open and unregulated, leading to degradation (the famous ‘tragedy of the commons,’ *per* Hardin 1968). Taking the second level first, Shipton and Goheen explain why communalism is a misnomer or oversimplification: “Private property need not imply *individual* property, or vice versa; not should individualism and collectivism be confused with exclusivity or inclusivity on the land. A family, lineage, or corporation can be just as exclusive about its land as can an individual...Nor should common property rights be confused with open access or a free-for-all system: they can, and often are, carefully regulated.” (Shipton and Goheen, 1992: 313) Toulmin and Quan similarly compare Hardin’s thesis with the reality in Africa: “In most cases, collective resources are managed by some kind of institution. As a result, such free and open access as described by Hardin rarely occurs, and the argument in favour of enclosing and privatising the commons falls away.” (Toulmin and Quan, 2000a: 7) And Cousins (2000) blames Hardin himself for starting the rumour:

“What is common property? In the ‘new institutionalism’ ...*common pool resources* are public goods which are used simultaneously or sequentially by different users because of difficulties in claiming or enforcing exclusive rights, or because they are so sparse or uncertain that it is not worth doing so (Ostrom, 1990: 30). Many are subtractable in character such that one user’s offtake will affect the availability of the resource to others users. When the rights and duties of groups of users in relation to these resources are defined and enforced, the resources become common property, as

distinct from open access. In the latter, which Hardin (1968) famously confused with *common property*, rights and duties are not well-defined, and a ‘tragedy’ of over-exploitation is a possible, and likely, outcome.” (Cousins, 2000: 152)

Cousins goes on to summarise how previous typologies of African tenure have been mistaken:

“Most land tenure systems in Africa are ‘communal’ in character, although, as Bruce (1988) points out, this is in some respects a misnomer, since it is sometimes taken to imply common ownership of *all* resources, and collective production, which are rarely found. ‘Communal’ means, in the great majority of cases, a degree of community control over who is allowed into the group, thereby qualifying for an allocation of land for residence and cropping, as well as rights of access to and use of the shared, common pool resources used by the group (i.e. the commons). Groups often restrict alienation of land to outsiders, and thus seek to maintain the identity, coherence and livelihood security of the group and its members.^[9] However, allocations of residential and arable land usually result in strong rights for individuals and families, or both, who sometimes also exercise rights over land which contains common pool resources such as water points, or wetter areas with dry season grazing....The net result is a ‘communal tenure’ system which is in fact a *mixed* tenure regime, comprising individual, family, sub-group and larger group rights and duties in relation to a variety of natural resources.” (Cousins, 2000: 152-154)

Bruce (2000) points out that tenure is varied even within a community and so cannot be descriptively homogenised as communal or otherwise:

“The territory of a community operating a typical African tenure system has a landscape that is clearly divided into areas of land under different uses, with different tenures applying to different areas. Each area constitutes a tenure niche...As a result of these processes of tenure development, a varied tenure landscape emerges, with different tenure niches involving open access, common property and individual property. These niches may overlap with one another, as for instance when exclusive cultivation rights give way after harvest to use of the land as a grazing common.” (Bruce, 2000: 17)

So customary tenure is better described (in all its variety) as communal only as regards common pool resources, which are mostly regulated and restricted to outsiders; heterogeneous even within the community (tenure ‘niches’); contemporary (capable of adapting quickly to new circumstances); and sometimes fabricated under a veil of custom. Those who use, depend on, and sustain customary tenure should be assumed to be rational and well-informed, in the absence of evidence to the contrary. In view of this, problems of customary tenure systems should be differentiated between those that stem from a system’s (putative) internal instability or iniquity, and those that express a system’s inability to defend its members’ tenure against outside forces (as when outsiders obtain land by suborning customary authorities or manipulating statute).

⁹ Such practices are not confined to Africa. Some old residential title deeds in the United States still have embarrassing (presumably unnoticed) attachments prohibiting the new owner from selling the property to members of certain racial or religious minorities—a clear instance of restriction on transfer rights for purposes of tribal cohesion.

It may no longer be useful to hold customary and statutory tenure in contradistinction, because the literature shows that the descriptive boundary between the two is dissolving. Whereas customary tenure was once caricatured as communal, it is now clear that it typically provides for strong individual cultivation rights. Whilst customary tenure has been criticised for insecure arbitrariness, in practice state titling is at least as arbitrary. Customary land was supposed to impede credit because it is not mortgageable, yet neither does titled land stimulate lending by providing adequate security for the lender. The difference between customary and statutory tenure may therefore be not so much the nature of the tenure offered by the two regimes, but rather the socio-political nature of the regimes that underlie the tenure—their functions, power bases, and constituencies.

2.9 Definitions of Tenure Security

2.9.1 The Relevance of Titling

Title used to be implicitly equated with tenure security; hence it was recommended as a prescription for insecurity. But in reality, to obtain a title is to add one form of guarantee to another (or substitute for it).¹⁰ “Titling does not simply increase individual rights as much as change the nature of groups on which individuals rely to protect their claims.” (Shipton and Goheen, 1992: 316) A title is a legal instrument that is worth no more or less than the quality of guarantee that the instrument’s guarantor—the state—offers (specificity, assurance, duration). Assumptions of ideal institutions no longer hold water. Moreover, to the extent that obtaining a title may alienate the smallholder from the local polity that backs customary land rights, a title may actually cause less security.

The surveys presented in Bruce and Migot-Adholla (1994) generally took a static or snapshot view of titles: a respondent either had one or did not. But land tenure reform that introduces titling initiates a dynamic process wherein land rights change (and change hands). Indeed, one of the three postulates of the neo-classical model predicts that a land tenure system with strong transfer rights (i.e. the right to sell the property to anyone) will lead to more economic efficiency, because inefficient (unproductive) users will have the incentive to sell to efficient potential users, who in turn will have the incentive to pay a price for the land that reflects the income stream from their planned more efficient use. Efficient users win the day. So titling, viewed statically, can be said to confer greater security; however when viewed dynamically and through the lens of experience with political economy, titling as a process has a strong risk of diminishing tenure security, especially for those with a lesser initial endowment of wealth, education, access to institutions, and power relations—ironically exactly those vulnerable

¹⁰ Thus proliferating the arenas of contestation and claims, and thus the fluidity and ambiguity, as Berry (1993) describes the result of attempted codification of customary law.

people whom land reform is supposed to benefit. “In other words, titling increases tenure insecurity for the poor because it places a formidable weapon in the hands of the rich who have both better ability to pay the price of registration and superior knowledge of government bureaucracy and procedures...” (Platteau, 2000: 68)¹¹ Experience (as in Kenya) demonstrates that getting past the dynamic stage to the promised land of universal titled security takes decades, if indeed it will ever be attained at all. So is it sensible to ignore the dynamic stage which may be permanent? Where access to titles is unequal, as is predictable in settings with imperfect governance, such as the case in Zambia (*per* Hansungule et al., 1998), land will accrue to the powerful, and insecurity will worsen for those without access to titles.

Titles may also lack in practice the implied attributes necessary to activate the economic logic of tenure security. Credit supply response may be deterred as a result, for several reasons:

“In the lineage-based settlement systems found in most of the higher-potential and more densely settled farming areas of Africa, cultivators tend to live among kin or clansmen. Lenders who try to seize a loan defaulter’s land find they cannot use the land or resell it, because those neighbouring relatives have ways of making life difficult for whoever tries to take it over and farm it...[Another] reason is plainly pragmatic. Farmers even in titled areas tend not to report their inheritances, subdivisions, gifts, sales, or other land transfers to state authorities...A decade or two after titling, land registers obsolesce and become fictional.” (Shipton and Goheen 1992: 317)

In such circumstances possession of a title is poor evidence of current land rights. What is important is not whether something is called a ‘title’ or even whether it has the necessary attributes *de jure*, but whether its presumed attributes operate in practice.

Taken together, these arguments seem to show that titling *per se* is a red herring. Past proponents of titling equated it with tenure security because they implicitly assumed effective and equitable governance (among other things). Now we see that the dynamic process of titling, if implemented with imperfect governance, frequently reduces tenure security and equity although designed to enhance both. We also see that one of the two other postulated positive effects of tenure security (improved credit supply through collateral) depends as much on quality of governance as on the contents of the legal instrument. As a result, titling (advocated, albeit with caveats, as late as Feder and Noronha, 1987) is now considered to be non-essential (DFID 1999, Quan 2000) if not counter-productive, even at the World Bank:

“During the 1970s and 1980s, there was a consensus on the need to formalize property rights by creating documentary evidence—title deeds. However, the earlier consensus

¹¹ This is theoretically more true in voluntary/sporadic titling programmes than in the universal/compulsory type; indeed, the most common reason to go to the trouble of the latter type is to avoid favouring particular interests and to distribute the benefits of title evenly. However, true manifestations of the universal/compulsory type are nearly non-existent in SSA, perhaps because they require exceptional capacity in governance.

around this issue has changed and become more nuanced. For instance, most policy analysts now no longer simply assume that formalization in a given context would necessarily increase tenure security, first, and lead to collateralised lending, second. The original assumptions have now become questions for empirical research...Will security be higher if someone has a formal property right—a title deed or a lease, which is issued by the state? This need not be the case, as some title deeds are not worth the paper they are written on, and create more confusion than security...” (van den Brink, 2003: 9-10)

But the belief that titling is the wrong prescription for enhancing tenure security in SSA does not negate the point of the neo-classical model, that more security should mean more productivity. It merely means that tenure security to date may not have been well defined or measured in the African context—certainly not when it was equated with titling, and perhaps still not yet.

2.9.2 Disaggregating the Components of Tenure Security

Sjaastad (1998) found in northern Zambia that specificity of rights increased as land became scarce, but security of rights did not. He explained this with reference to the problem of defining tenure security vis-à-vis different effects: “These conflicting results are a reflection of the problem that although both methods ostensibly measure security of tenure, they in fact measure completely different things.” (Sjaastad, 1998: 165) Sjaastad and Bromley (2000) criticised the practice (as used in Bruce and Migot-Adholla, 1994) of elaborating tenure security into such components as breadth, duration, and assurance of rights.¹² ‘Tenure security’ should properly only refer to assurance, because the other components have theoretically distinct effects on incentives and abilities: a farmer with durable (long-lasting) rights but poor assurance of those rights will have different incentives and opportunities than one with broad, assured, but short-lived rights. So, hearkening back to the three effects of the neo-classical model, do all three hypothesised effects of depend on the same definition, or component, of tenure security?

Using the language found in Bruce and Migot-Adholla (1994), it is possible to see that they do not. The credit supply effect, examined micro-economically, depends on the lender’s confidence that s/he can seize and liquidate the borrower’s collateral land in case of default. In other words, it depends on assurance of transfer rights.¹³ However the case of Kenya (Carter et

¹² Sjaastad and Bromley explain on Bruce and Migot-Adholla’s behalf that the practice was necessitated by the synthesis of several separately-conceived studies, rather than representing the latter authors’ best conceptualisation.

¹³ Bruce and Dörner (1982) suggest another possible effect of tenure on credit supply: that which assures the borrower will produce and therefore the lender will be repaid. “The lender looks at the leasehold as an indicator of the likelihood of the success of the enterprise for which credit is sought, an indicator of credit worthiness rather than as security for the loan in the strict sense. Indeed the fact that the farmer has been able to negotiate the administrative steps required to obtain a lease may be considered an important recommendation.” (Bruce and Dörner, 1982: 35)

al. 1994, Migot-Adholla et al. 1994) shows that the transfer rights that exist *de jure* may be insufficient in practice to inspire confidence in the lender, because assurance can be impeded by a community reluctant to let a parcel of land be alienated to an outsider. If transfer rights cannot be assured, titles are of limited use in obtaining credit. 'The low incidence of formal credit in Kenya ...suggests that transformation of land tenure alone will not lead to the development of active rural credit markets' (Bruce et al., 1994: 254-255). But one must be careful: what the evidence actually says is that the transformation of land tenure in Kenya has been incomplete if it aimed to attain assurance of transfer rights sufficient to make land useful as collateral. Durable and assured use rights without assured transfer rights are of no interest to lenders unless they wish to engage in farming.

Regarding credit demand, it would be mistaken to infer that the neo-classical model suggests a credit demand effect of tenure security, at least of short-term credit for annual inputs, the most typical use of rural credit in SSA. Security in the sense of duration and assurance should be irrelevant to decisions on short-term inputs (except in the rare case that the tenure is so insecure that the farmer may be ousted before harvest). If for example a farmer wishes to double her area under cultivation for a season, has access (albeit temporary) to land to do so, and can obtain credit to double the purchase of inputs, then she need not consider the long-term tenure security of the borrowed land, because the harvest will be in before long-term tenure comes into play. If a farmer wishes to intensify production on a fixed area of land, perhaps through purchasing hybrid seed and fertiliser, then she may seek credit to do so, and may have more success obtaining credit if she can offer the land as collateral; but this is a credit supply response, not a demand response, because the increased demand is independent of tenure status, whereas the increased supply is not. So the credit demand effect should be viewed as null. Theoretically it is sounder to postulate an effect of tenure security on demand for long-term credit if such credit is used for fixed land improvements, assuming that the investment demand effect also holds; however such long-term credit is almost never available to SSA smallholders. As a corollary, farmers wishing to improve the land would be confined to labour-intensive and not capital-intensive technologies.

The investment demand effect depends most obviously on duration and assurance. The farmer who considers making a fixed investment will be wary of the risk of being shifted off the land before the investment has paid for itself or without compensation for the lost improvement. Strong duration and assurance of rights will alleviate these concerns. There is, however, also a theoretical effect of transfer rights on investment demand. Transfer rights change the nature of the landholder's wealth endowment. Use rights unaccompanied by robust transfer rights endow the holder merely with the income stream from the land's (and fixed investment's) production, less input costs, and (usually) requiring labour to realise. Robust transfer rights

additionally endow with potential liquidity, from the land's (and fixed investment's) sale or rental, or (less assuredly) mortgaging. So transfer rights determine what kind of wealth the holder has, and what joint inputs must be made to realise the wealth. Platteau puts this in slightly different terms, differentiating the theorised effects of robust tenure rights into 'Assurance effect' (promoting investment and other long-term efficient use) and 'realisability effect' (being able to liquidate investment, via transfer rights). (Platteau, 2000: 55) Without transfer rights, a farmer who installs fixed investments narrows her future options to (1) maintaining, and enjoying the income stream from, the investments, or (2) abandoning them and losing their unexhausted value. Therefore, to decide to make fixed investments, she must be certain that she will not have a better investment option for the life of the investment. In such circumstances, mobile investments (like livestock) seem a safer use of funds. Transfer rights and their realisability effect give the farmer the option of liquidating the investment (selling the improved land) if a better investment option (or any other need or use for liquidity) arises. Transfer rights are therefore not theoretically necessary to investment demand, but can be expected to increase it.

Table 2.1 illustrates these combinations:

Table 2.1: Intersections of Land Rights with Supply and Demand Effects

	RELEVANT RIGHTS →	Usufruct	Transfer	Assurance	Duration
EFFECTS ↓					
Credit supply			✓	✓	
Credit demand	(null)				
Investment demand			✓	✓	✓

If these combinations are correct, then the way to test the neo-classical model would be to look for the economic effects at the intersections with the relevant specific rights.

The experience of Kenya also raises an epistemological point, that there may not be enough variability in tenure security to test its effects accurately. The titled sector in Kenya, which appeared at first glance to constitute an endpoint in the range of SSA tenure security, turns out to lack some attributes that are key (according to theory) in stimulating the credit response and

productivity effects—and the usefulness of Kenya as an empirical case to test the economic logic is therefore diminished.¹⁴ If Kenya, as an SSA outlier in the prevalence of titling, fails upon closer examination to manifest the theoretically necessary components of tenure, then the other country case studies are even more likely to lack true variability, and consequently should not be taken as definitive. By contrast, Thailand (Feder et al., 1988), in which over 50% of respondent households were found to be using formal credit, exhibited greater variability: specificity of rights and assurance of transfer rights was generally sufficient to inspire confidence in lenders, titles were frequently required as collateral by official lenders, and foreclosure with repossession did happen. While foreclosure is no cause for celebration, it is at least an indication of a fairer test of the economic logic.

It is time to revise the terminology of land tenure studies, because this exercise in conceptual disaggregation makes it clear that the collection of land rights supposed to stimulate production under the neo-classical model are not coterminous with ‘tenure security.’ Security itself may theoretically be good for fixed investments, but what is relevant to stimulation of credit supply is enforceable seizure of land, which surely is a form of tenure insecurity. Transfer rights increase investment demand irrespective of security. Land rights must therefore be unpacked rather than conflated under ‘tenure security.’

2.10 Low Demand for Credit

Apart from conflation of tenure security with other land rights, a second major reason why the neo-classical model does not hold empirically in SSA is credit, not just the lack of supply response as described above, but also the lack of demand response. That is, even if titles are accessible and offer tenure security, there may be little or no credit demand response: farmers may not necessarily respond by mortgaging. This goes beyond the point made above (Section 2.9), in which it was argued that credit demand is theoretically unchanged as tenure security increases. It is now considered whether credit demand might actually decrease if land is required as collateral. If so, even if there is tenure insecurity, and even if titles are an effective remedy for insecurity (i.e. if both diagnosis and prescription are correct), increased credit use is not likely to result.

We have reviewed reasons for the lack of supply response: (1) credit markets in many SSA countries are too unstable and under-capitalised to offer a supply response to newly titled smallholders; (2) lenders view titles in these contexts as poor collateral. Another reason may be simply that farmers are a bad risk for lenders, irrespective of land tenure:

¹⁴ It remains very useful, however, as an example of how reforms enacted in statute may fail to change behaviour and activate an economic model.

“Idealistic titling programmes often purport to make land usable as collateral for loans by smallholders. But *land mortgage systems have failed* in rural Africa for nearly a century and are likely to continue failing...Based on European and American models, these systems ignore several hard realities. The first is agronomic and economic. Credit means debt. Most African rain-fed smallholder agriculture is too risky, and markets and prices are too unreliable, to allow reliable loan investment and repayment.” (Shipton and Goheen 1992: 317)

And, from the borrower’s perspective: ‘Smallholders may fail to apply for loans because they perceive a high risk of losing their land through foreclosure, as the experience of Kenya testifies...’ (Platteau, 2000: 59). And: ‘Whatever the exact content of the land rights claimed by the poor, it is essential to bear in mind that what they seem to desire is security of tenure in its most fundamental sense—absence of risk of loss of land—rather than a security which enables or encourages long-term investments or transactions...[T]he demand for a return to joint use land rights or to other kinds of traditional land arrangements must be understood from this safety-first perspective’ (Platteau, 1992: 26).

The basic problem of the producer’s risk in using land as collateral is not captured in the neo-classical model.¹⁵ If farmers value tenure security only or mainly for the increased access to credit that it affords, then they will mortgage themselves to the hilt. However if they value tenure security for its own sake, as a guarantee of livelihood against risk of dispossession, then it would be perverse for them to collateralise their land, because that opens the possibility of dispossession. In places with few or no off-farm employment opportunities, or other safety nets, it seems rational to be risk-averse vis-à-vis land loss, and to value tenure security for its own sake (“safety first”). An area for future research may be to try to measure smallholders’ behaviour and microeconomic choices in this situation, in other words to measure their risk aversion to land loss versus desire for increased income (and especially to see how such choices change across levels of assets and income).

If low credit supply is the problem, then land tenure reform, especially in the advanced form of titling, is an expensive solution—so much so that it may be cheaper to throw semi-secured credit at farmers and accept a high default rate, or otherwise ‘addressing the collateral problem directly (perhaps through the formation of mutual-responsibility borrowing groups)...’ (Carter et al., 1994: 156). Livestock also suggest themselves as useful collateral. But beyond that, because of low credit demand stemming from risk aversion on the part of producers, it is also likely to be a futile solution. A policy that hopes to increase aggregate output through the

¹⁵ Though there are some survey data on the subject. Roth et al. (1994) present a summary of responses as to why credit use was low in Uganda. The respondents cited more demand reasons than supply reasons: fearing debt (demand reason), fearing loss of collateral (demand), lack of collateral (supply reason), and lack of knowledge of credit sources (perhaps a conjunction of supply and demand).

mass use of land as collateral is counting on making a population of ‘ideally-informed risk calculators’ (or, to put it more plainly, gamblers) out of a population of risk-averse poor people.

2.11 Land Market Activation

Part of the neo-classical model predicts efficiency gains from land market activation, namely that efficient users will acquire land from inefficient ones. (Like credit supply, this actually occurs as a result of transfer rights, not tenure security *per se*.) However a market needs supply, so limited supply of land may stymie land market activation. Land may carry symbolic and cultural value, as a “unique social amenity” (El-Ghonemy, 1999: 4), that is not reflected in market value.

Also, experience suggests that in many economies, one does not have to be an efficient user to find the wherewithal (or motivation) to obtain title to land: “First, in ordinary circumstances the land market does not appear to be activated by the provision of greater tenure security, through titling. As a result, the ‘realisability’ effect predicted by the ETLR is generally insignificant. Second, even when a land market is active, most land transfers do not seem to promote increased efficiency of resource use.” (Platteau, 2000: 62) Unfair adjudication, asymmetrical access to institutions, use of land for speculation or as a bank for wealth, all contribute to inefficient users’ ability to obtain title.

This begs the question of, is land-holding really inefficient for the ‘inefficient user’? If so, the rational user would not bother to pursue it. Obviously such land acquisitions do return some perceived benefit, perhaps for “...non-economic motives such as social prestige and political power. It is common practice not only that the traditional elite penetrates the modern network of administrative-political power, but also that the new urban elite tries to get elected, co-opted or appointed to traditional chieftaincies after having acquired a significant acreage of local land...” (Platteau, 1996: 52) The putative inefficiency refers to aggregate agricultural production and/or well-distributed income, not individual returns.

The circumstances of buying and selling may also not be conducive to efficiency gains. Offering land for sale, when it does occur, is often occasioned by distress. Not only is this loss of assets bad for the distressed party, but also: “...in addition, given that (distress) sellers frequently sell only a portion of their holdings, while most purchasers are not agricultural entrepreneurs seeking to enlarge their farm, holdings which grow by purchase are typically formed in a fragmented way and consolidation does not result from the operation of the land market...” (Platteau, 1996: 53)

A titled system contains mechanisms that can lead to greater land concentration:

“The presence of multiple rural market failures - arising, in particular, from absent insurance markets, wealth-differentiated credit markets, and declining self-insurance capacities on the part of poor rural dwellers - may determine individual wealth trajectories that are highly dependent upon initial endowments. Thus, a succession of bad shocks may drive poor farmers to sell land parcels while better-endowed farmers are able to insure against such shocks through access to credit, temporary depletion of accumulated non-land assets, diversification of income sources (including access to non-agricultural incomes), and a strong social network through which help can be sought.” (Platteau, 2000: 64-65)

Note that this describes how wealth-differentiated distress selling can occur not as part of the titling process itself, but afterwards, in a liberalised land market; however some of the same mechanisms may act to determine who manages to obtain title and who does not.

Apart from such non-economic concerns, people, especially the poor, value land as a form of social security: “Considerations of social insurance generate a deep attachment to land which is understandable in a context of scarce alternative employment opportunities and risky labour markets. For many people working in urban areas, land serves both as insurance against uncertain employment, as a pension fund for their old age, and as a means to avoid landlessness in the next generation of the family...” (Platteau, 2000: 62). This phenomenon was documented by Moyo (1995), who detected urban residents’ demand for rural land as a factor in rural land use and markets in Zimbabwe:

“There is similar demand for land for indirect investments in livestock ‘kept’ by family and friends, for burial and retirement purposes, given the lack of social security for most people in urban areas and a signal of the weakly developed investment facilities for urban savings in Zimbabwe. Evidently, while over 50 per cent of Communal Area residents do not own cattle, almost all households ‘keep’ cattle for urban relatives. In some areas as much as 70 per cent of local cattle are owned by external people, who thus dominate the use of grazing lands and land tenure in such areas.” (Moyo, 1995: 270)

Moyo goes on to argue that if government fails to address the investment climate that forces urban savers to meddle in rural holdings, excess land demand and tenure conflict will be exacerbated.

Experience therefore gives plenty of reasons why land markets may not be activated—and even if activated, why land may not accrue to productive users or consolidated holdings as predicted. There is likely to be a longitudinal dimension to this effect: inefficient acquirers may in turn be bought out by efficient ones, or vice versa, as factor prices and opportunity costs change. Unfortunately, this is an area of the neo-classical model that has received little empirical attention, perhaps because it requires research on a macro-economic scale to address.

2.12 Technology

This set of critiques argues that part of the reason that no strong effect of tenure security on fixed investment is seen is a different kind of investment supply problem: lack of advantageous and accessible technology.

In general, to find evidence that tenure security increases investment demand, one has to assume or argue that the farming terrain is amenable to significant improvement by certain fixed technologies. While this may be true in most terrains, it is reasonable to question whether, in a semi-arid Sahelian zone for instance, low-cost technologies exist that will profitably improve productivity (Platteau, 1996: 62-63). To take one technological example: boreholes and dams are the first-order technological means to escape vulnerability to drought, but their cost (typically thousands of dollars) puts them beyond the reach of small farmers. Hand-dug wells (sufficient for watering cattle if not for irrigation) are usually an affordable alternative, but these may well be unattractive or infeasible in a given zone, for instance because of aquifer depth, unreliability, or rocky or unstable soils. Therefore no water works would be observed in a zone that badly needs them. Long-term credit is rarely available to African farmers, so *ipso facto* one would expect most observed fixed investments to be limited to labour-intensive, low-capital types. (Indeed farmers may prefer labour-intensive varieties to avoid entanglement with credit.)

The limited availability of advantageous technology constricts the range of observed dependent variables in empirical studies. In Matlon's Burkina Faso study, basic land improvements such as tree-planting and terracing were not practised in the study area (Matlon, 1994). The only useful variables identified were fallowing and the use of chemical or organic fertiliser. In such a situation of low uptake of land improvement technologies, it may be unrealistic to expect statistical analysis to show a positive effect of tenure security on investment decisions. (By contrast, in studies where a greater range of fixed investments was observed, such as Rwanda in Blarel 1994, a positive effect was shown.) Ideally, such research should include the full range of possible dependent variables; however it would take some methodological inspiration to identify correlations with a dependent variable that is not observed. So the perfect test would be a study area where there is good variability not only in the independent variable (tenure), but also in the dependent variables, extending well into the 'transformed,' high-input end of the farming range. Without a country that exhibits both the transformed end of the farming range and also a land administration system that enforces mortgaging (which was lacking even in Kenya), it is not possible to test the effects of such a

system. Rather it is only possible to speculate on the putative effects of such a system, on the basis of lesser variations within more restricted systems.

Investments must also be properly categorised for analysis. Matlon (1994) interprets the use of chemical fertiliser in the Burkina Faso study area as a method of long-term soil fertility management, hence a fixed investment. But fertiliser use would also produce short-term gains in yield. Indeed it is possible to imagine that insecure farmers might like to enhance soil fertility by means of short-term, non-fixed chemical fertiliser, whereas farmers with secure tenure might prefer to enhance fertility by other, more fixed methods. Place et al. (1995), in their Zambia study, classify the application of chemical and organic fertilisers as an agricultural development indicator to be tested for association with land tenure. However, since such fertilisers yield returns within one season, tenure security contains no theoretical incentive to use them (though supply might be facilitated by credit access). Such categorisations should be clarified before the neo-classical model can be considered fairly tested.

2.13 Governance

Governance must be an issue if ‘...the state is both an inefficient administrator as well as a predator on land that in law, and/or in fact, belongs to ordinary land users...’ (Okoth-Ogendo, 2000). The following series of critiques implies that the prescription of titles is wrong in the SSA setting: titles as governed are not accessible and do not offer security or other attributes necessary to activate the economic logic. Previous sections have implied that the neo-classical model is not necessarily deeply flawed in theory, but requires careful disaggregation of its concepts and assumptions if it is to be useful in the SSA context. The most analytically damaging of its assumptions may be that of perfectly functioning institutions, which leads it to yield policy recommendations that are at odds with the capacity and practices of SSA governance.

A land tenure reform programme that ignores governance is unlikely to achieve its objectives. Equally, part of the failure of past tenure reforms was that they ignored political economy in preference to a neo-classical perspective that argued for the possibility of an objective optimum:

“What the past also tells us is that land laws in African countries, as in all other countries, have been first and foremost the products of politics, not of ‘objective’ considerations of what is best for economic or social or sustainable development. Being products of politics, they have been enacted by and are directed to benefiting the ruling group in each country. It might seem obvious that a simpler land law or a land law that integrates the people’s law with state law would be a positive good to be aimed for, but it might not be seen that way by the political and administrative elites. A complicated law and a law which denies rights in the land to the majority of people,

leaving them at the mercy of administrative discretion, provides opportunities for the accumulation of land and rent-seeking behaviour by those elites. Independence was three or more decades ago for most countries in Africa; why has there not been a greater effort to develop more relevant people-friendly land laws all over the continent?” (McAuslan, 2000: 92)

Land reforms, tenurial and redistributive, obviously incur political conflict; sometimes they are intended to. “Many supposed land reforms have faltered because they were opportunistically conceived in order to mobilise support at a critical time in the life of a government (or an aspiring government).” (Adams, 1995: unpaginated HTML document). Tenure reforms may also be expected to incur political conflict, because, as mentioned, when land tenure changes, land changes hands. Berry describes an example from the colonial era: political parties in Ghana in the years leading up to independence courted chiefs with promises of land rights, thus setting the stage for the future. “...[S]uch strategies of political mobilization served to link debates over customary jurisdictions and land rights to emerging patterns of party conflict, ensuring that the politicization of rural property rights continued after the end of colonial rule.” (Berry, 1993: 124) (One notes that it may not be entirely consistent for the author to implicitly ascribe the politicisation of rural property rights to colonial rule, after having described at length how the enduring essence of indigenous land rights is investing in multiple social networks to protect them—in a word, politics.) Such debates on who are to be the holders and guarantors of land rights were echoed in, among other places, Zambia leading up to the Lands Act of 1995.

Decentralisation, a favourite donor solution to sub-optimal governance, is not a panacea. “Despite their apparent democratic appeal, there is no guarantee that elected officials will, in practice, listen and respond to the local population, since political processes and funding sources will mean they tend to look upwards, to higher levels of power.” (Toulmin, 2000: 244) One land administration strategy is to set up a parallel local (decentralised) land management body, the rationale being that de-linking local land administration from local government may curtail opportunities for corruption or patronage. But it is expensive to set up a parallel system; a powerful autonomous land board may become immune to accountability; and legitimacy is low with new institutions. An alternative model is to formalise the role of traditional authorities in land management, alongside statutory local government; but customary authorities may also be non-accountable, and the two systems may clash. At any rate, the appeal of decentralisation as a policy concept is that it diagnoses governance problems as stemming from concentration of power, not from a technocratically-measured lack of capacity.

Perhaps governance is better rephrased as power. "To have a right is to have the capacity to compel the coercive power of the state—or the pertinent authority system—to defend your interest in a particular outcome. A right is not simply passive permission to have and to control some object or to do certain things." (Sjaastad and Bromley, 2000: 366) If property is seen "as a bundle not of rights...but rather of powers" (Verdery, 1998: 161), then where power is unequally distributed, concentration of land rights will soon follow (Peters, 1999). The negative effects of titling or other tenure reforms may not be due to their legal specifications, but instead to the way in which they are administered and adjudicated (Hunt, 2001: 12), which in turn reflects the distribution of power.

Tenure reform cannot be divorced from considerations of governance. Land legislation is no substitute for the hard work of improving governance, whether viewed in technocratic or power terms. Forcing titling or other tenure reforms onto a system that cannot support it administratively and judicially is likely to worsen governance and people's confidence therein. If tenure insecurity is fundamentally due to an inability of rights-holders to get their rights enforced, whether the legal instruments are customary or statutory, then the problem ultimately traces back to powerlessness, and proposed solutions must address this.

2.14 Research and Policy Frontiers for SSA Land Tenure Reform

Researchers have not overlooked the significance of the fact that implementation (where it happens) of recommended land reforms has not had the desired results. "The example of land titling programmes demonstrates the dominance of economic theory over a careful consideration of how things work in practice." (Toulmin and Quan, 2000a: 12) Since blanket titling is in disrepute, what policy options are driving current research, and how can theory be made to conform to "careful considerations of how things work in practice"?

It cannot be assumed that land tenure reform is simply a legislative matter:

"The embeddedness of land-holding in ecological, social, cultural, and political life means that one tenure regime can seldom be legislated away in favour of another. To try to do this is to add layers of procedures or regulations on to others unlikely to disappear, and to add possibilities of manipulation and confusion between the multiple opportunities, and conflicting constraints, of older and newer land-holding regimes. And, as agriculture is commercialised, added cyclical and secular changes of markets and prices keep shifting the resource base underlying land competition and conflict in ways that can cause confusion. Official tenure rules quickly obsolesce." (Shipton and Goheen, 1992: 316)

Berry concurs:

"...African governments have both intensified ethnic tension and political competition and rendered them more uncertain—thereby reinforcing people's propensity to invest in multiple social networks. With respect to land rights, the resulting proliferation of

social networks has reinforced the multiplication of claims to land, making it difficult to enforce legislation designed to clarify and standardize tenure rules...In general, the impact of land-reform programs on actual patterns of access and control has been, at most, tangential.” (Berry, 1993: 132-134)

However, resettlement resulting from redistribution is an exception. “If..., for one reason or another, the local informal order is absent, has vanished, or is proving unable to regulate access to land, the state may be well-advised to substitute for this missing structure. Resettlement or new colonisation areas, as well as areas subject to acute land pressure (including urban or peri-urban areas) are cases in point.” (Platteau, 2000: 58) Resettlements can be ethnically heterogeneous: “Where members of ethnic groups with very different customs are quickly intersettled on equal standing in a new area, however, titling may sometimes provide a basis for mutual understanding other lacking in land affairs.” (Shipton and Goheen, 1992: 317) In other words, the state supplies the tenure security that the community cannot, because the community is heterogeneous. This argument is particularly relevant for southern Africa, especially Zimbabwe and South Africa, where the rhetoric of redistributive land reform predominates, and the question of tenure reform arises as much in relation to areas where new smallholders are resettled on broken-up large holdings as to areas already under ‘communal’ tenure.¹⁶

Most of the research and policy conclusions so far reviewed have been largely negative, i.e. what does not work. “But what, then, *ought* governments and aid agencies to do?...

“If the undeniable truth about African land-holding is that it varies, the inescapable policy suggestion is that it ‘depends’...That no level of bureaucratic hierarchy (the nation, the district or division, the community, the lineage or family, the individual) will ever gain full control over land-holding is certain: planners at any level should count on different rights continuing to be exercised, and challenged, at different levels of administration¹⁷...We suggest, too, keeping in mind the many possible aims of intervention in land-holding management. Possible economic goals include growth, efficiency, and equity—in production, distribution, or consumption. Political goals may include stability, democracy, or quality of popular participation in decision-making. Social and cultural goals may include comprehensibility, fairness, and general well-being. To these must be added ecological and technological aims like biological diversity between or within species, conservation of soil nutrients and structure, sustainability of yields, or optimum energy flow.” (Shipton and Goheen, 1992: 318-9)

Titles may be close to the rubbish heap of SSA history, but better-defined tenure security is still alive as a research area. Quan emphasises the continued importance of security in defensive terms: ‘In these circumstances clarification of tenure rules and the provision of

¹⁶ Tenure reform in South Africa’s ‘communal areas’ or ‘former homelands,’ which suffer from heavy land pressure and gravely mistrusted ‘customary’ leadership, is seen by some as no less urgent than redistribution (Lahiff, 2001).

¹⁷ This is not a solely African phenomenon. Land use rights are routinely circumscribed in Western countries, as in residential vs. commercial zoning.

greater land security are essential in order to protect the asset base of the poor, and to promote productive and sustainable farming...The maintenance of customary tenure systems, can, in many circumstances, provide all the benefits of private titling (individual tenure security, adaptability to changing economic circumstances and accessibility of small scale credit) without the high financial and social costs which titling programmes tend to involve' (Quan, 1997: 3).

A consensus has been taking shape that land programmes must be more specific and adapted to local situations: 'A new paradigm is emerging which does not prescribe a specific approach to land reform. The paradigm is based on pluralism and the imperative of African national, regional and local governments, tribal groups, villages, communities, and civil society organisations negotiating their own solutions to securing access to land.' (Toulmin and Quan, 2000a: 5) Past diagnoses have been erroneous in part because they were too general and deductive, not empirically verified and location-specific. "Diagnosis of land-related problems as they affect the poor, and of opportunities and constraints to enhance land security, achieve greater clarity in tenure rules, and to improve equity in land distribution" should be among the "criteria for land reform interventions" (Quan, 1997: 3).

Adams et al. (1999) echo these conclusions on how state-guaranteed tenure security is giving way to an approach of adaptation or gradualism: "In recent years, the tenure reform debate has tended to focus narrowly on the merits, or otherwise, of converting informal traditional systems of communal rights into 'modern' formal systems by a process of adjudication and individual titling. This narrow view of tenure reform obscures opportunities for reforms which strengthen the land rights of local people and ensure that their land cannot be alienated or otherwise used without their consent, neither by government, nor by 'developers' or other third parties." (Adams et al., 1999:9) The latter sentence refers to growing concern (echoing Hansungule et al., 1998, as well as Platteau 2000) that tenure reform or titling, whatever its stated purpose, mainly has the effect of facilitating inappropriate concentration of land—i.e. 'grabbing.' However, customary systems should not be idealised or maintained uncritically: "This recent recognition of the merits of communal systems of tenure by governments and donors should not downplay the developmental role of tenure reform nor assume that tenure change will inevitably work against the interests of the poor. Attempts at reform in Kenya, for example, were based on a narrow view of tenure options, i.e. communal versus individual. The belief that rural people are universally happy with communal systems and that legal confirmation of rights brings no benefits is certainly misplaced." (Adams et al., 1999:12)

Incrementalism and adaptation of existing systems, in practice necessarily *ad hoc*, are emerging in preference to imposition of monolithic freehold systems. What then is the way

forward for research and for the policy makers who may be influenced by it? One interesting by-product of the empirical literature is that in one case (Rwanda, described by Blarel 1994), the rate of land improvements rose sharply between degrees in the middle of the spectrum of tenure security, short of freehold title.¹⁸ This seems to demonstrate a means of determining the degree and type of tenure security that the small producers themselves considered sufficient incentive to make fixed improvements. Platteau (2000), assessing the evidence to date, also remarks that basic use rights without transfer rights (but with rights to inheritance) seem to be sufficient to stimulate investment. Because titling programmes tend to be expensive and inequitable (if not futile), such a finding seems to suggest a way forward for land tenure reform that meets its objectives of stimulating land improvements without incurring the costs and iniquities of a titling programme. Looking for such ‘jumps’ has a practical, functionalist appeal. Rather than going the theoretical route of ascribing insufficient land improvement to tenure security, with the attendant theoretical pitfalls of definitions, it may make more sense for surveys to pinpoint what the target population (small farmers) actually consider sufficient incentive to make fixed investments, and then make policy recommendations to bolster those incentives. Automatically, this would adapt the findings and ensuing policy recommendations to local prevailing perceptions, preferences and power relations.

Delville argues against the magic bullet approach of using land tenure reform as leverage for agrarian transformation. Instead, land reform, though it may have an economic impact, should primarily have a social goal: to avoid legally precarious situations for the rural poor. “In current circumstances, choosing a tenure policy is mainly a political choice about the system of authority—customary, state or mixed—and the geographical level at which land management should take place.” (Delville, 2000: 119) He suggests on-demand statutory recognition of some transactions, as when the transactors are not sufficiently well known to each other to rely on informal authority to enforce the contract; as well as other incremental new instruments. “It seems wholly unrealistic to try and eliminate legal pluralism [*overlapping systems of authority*] in the short term. These approaches clarify and stabilise a limited but crucial aspect of tenure dynamics and the problems of providing secure tenure.” (Delville, 2000: 120)

Toulmin and Quan (2000b) explore whether collective registration of customary rights might be a feasible compromise between attempting individual registration and leaving lands unregistered (hence vulnerable to grabbing). To their advantage, collective holdings (a) are easier to register than numerous individual holdings; (b) defend community rights; (c) can specify tenure rights over common property resources; (d) can create group rights where

¹⁸ From 33 per cent for land held under long-term usufruct to 74.1 per cent for family land (Blarel, 1994: 88).

customary tenure does not exist or has broken down. Disadvantageously, “The model does not cope well with changes and conflicts which may arise from the emergence of divergent interests within local communities (for instance between commercial producers, who may seek to acquire title in order to raise collateral for loans, and more subsistence-oriented households), or situations in which chiefs seek to sell off land for private gain, and cannot be trusted by communities.” (Toulmin and Quan, 2000b: 222) Nor do collective rights automatically resolve overlapping claims following displacement in land-scarce areas, as in parts of post-war Mozambique, and more recently in Angola. In South Africa, a history of corrupt chiefs alienating collective lands for private gain is necessitating a search for new methods of collective tenure. Collective registration therefore is essentially a defensive measure: in itself it does not resolve land contests within the community, nor does it allow land to be leveraged. It merely protects community land statutorily from external claims (such as concessions granted by central or local government to outside investors). Collective registration may be ‘offensive’ against poverty rather than merely ‘defensive’ against predation if well-defined collective property rights allow for clear negotiations and arrangements between communities and investors, who would have the confidence to invest under clear and legally recognised arrangements. Toulmin and Quan conclude that whether individual or collective tenure makes sense depends on local circumstances, institutions, and production relations (e.g. irrigation projects). Individual registration should usually be reserved for special cases, otherwise it may do more harm than good. “Better targeting of registration programmes, a willingness to experiment with a variety of mechanisms, and defining when best to go for individual versus collective approaches provide the three major challenges for future programmes.” (Toulmin and Quan, 2000b: 228)

Cousins (2000) argues that emphasis on rules (which he terms the defining feature of New Institutionalism) may be misplaced: consistent consensual practices may be more significant (*de facto* rather than *de jure*). “Rules, whether formal or informal, do not determine behaviour, but are a field or context for strategic action and interaction undertaken by diverse social actors.” (Cousins, 2000: 165)

A trend is already emerging in the most recent empirical literature to correct some of the inadequacies noted in this review, apparently in the realisation that identifying the effects of tenure on African farming requires a finer focus than the basic neo-classical model. Especially important is the disaggregation of components of tenure and those components’ differential effects on different economic outcomes, as noted above in Table 2.1. Deininger et al. (2003), using country-wide data from Ethiopia, find that transferability (i.e. land transfer rights) rather than tenure security *per se* is a strong determinant of certain types of fixed investment. The interaction of land rights and fixed investment varies across types of investment: insecurity

stimulates tree-planting (presumably in order to strengthen claims to land) but discourages terracing (which is more directly production-oriented), whereas transferability stimulates terracing while leaving tree planting unaffected. Endogeneity of land tenure (the possibility that the intention of fixed investment is to enhance tenure security, rather than security stimulating investment demand) therefore intersects with disaggregated rights and with different types of investment with different purposes. They also point out that endogeneity need not imply that government-backed tenure security is irrelevant: fixed investments made solely to reinforce security may be socially or productively sub-optimal, and therefore other guarantees of security would relieve the opportunity cost of such investment.

Brasselle et al. (2002) focus on endogeneity, which their evidence from Burkina Faso supports. Any apparent link between tenure and investment must be tested for bi-directional causality: “As a matter of principle, we expect that when endogeneity of land rights is not controlled for, tenure security is more likely to appear as inducing investment (since the relationship between the two variables is positive in either direction).” (Brasselle et al., 2002: 376) Their expectation is borne out in their data:

“Major findings of this study are that (1) land tenure security is influenced by investment; and (2) once this endogeneity bias is properly controlled, increased land rights do not appear to stimulate investment. Moreover, the influence of investment on land rights obtains not only in areas of recent settlement but also in old-settled villages with a well established customary system of land tenure. Such findings bear out the scepticism expressed in a recent literature about the existence of a positive causal relationship between land tenure security and investment in the case of sub-Saharan Africa...” (Brasselle et al., 2002: 400)¹⁹

They explain tenure security’s lack of stimulation of investment as a misapprehension of the nature of land rights in the study area (and by extension in areas of other studies), where even borrowed land has a certain security because of kinship ties. They consider their results to be no surprise in view of previous results from Thailand (Feder et al., 1988) and Kenya (Carter et al., 1994), which show that credit is the key intervening mechanism between tenure security and greater investment, and conversely that no strong effect is seen where formal credit markets do not operate (as was seen in parts of Thailand and Kenya as well as Brasselle et al.’s study area). They also find, akin to Deininger et al. (2003), that different types of investments have different interactions with land tenure: some are specifically undertaken to enhance tenure security and are technically suited to so doing (tree planting, parcel demarcation).

¹⁹ This finding is subject to various analytical limitations, for instance a maximum age of five years for the investments, beyond which they argue the contemporary tenure status could not be confidently assumed.

Place and Otsuka (2002) similarly found in data from Uganda that the direction of causality between tenure and fixed investment varied with different types of investment: “[C]offee planting is used by farmers to enhance tenure security, while fallowing is practised to a greater extent by farmers on more secure holdings.” (Place and Otsuka, 2002: 105) However, tenure was found to have no impact on the productivity of crop farming.

Firmin-Sellers and Sellers (1999) suggest that “Rather than ask whether titling programs have failed, we should ask how programs have succeeded.” (Firmin-Sellers and Sellers, 1999: 1117) They find in data from Cameroon that titling (*per* the 1974 Land Ordinance) has not had the desired effect of creating a rural middle class, but has been used selectively by farmers and administrators alike in advantageous ways. Farmers pay for concrete boundary markers as part of the titling process, but tend to drop the expensive remainder of the process, because the markers themselves enhance security (being sufficiently respected by the community even without title). Administrators devise a compromise between local custom (in which lineage heads hold vacant land for future generations) and the Ordinance (which holds that undeveloped land cannot be titled) by issuing title for under-developed land by exaggerating or blurring the existing improvements. These findings tend to support Cousins’ point (2000, *op. cit*) that examining practice rather than rules is more likely to yield policy guidance and theoretical clarification.

These new studies show that interactions between land tenure, fixed investments, and productivity are far from linear. They therefore revive old questions: is it generally true that tenure security affects fixed investment only weakly, and that fixed investment in turn does not boost productivity? What do these interactions tell us about the respective natures and relative merits of customary and statutory tenure? What is tenure reform’s place, if any, in the hierarchy of needs of African farmers? Also, in the spirit of Firmin-Sellers and Sellers (1999), perhaps the interesting question is no longer whether titling programmes have achieved their original aims—they clearly have not—but what positive effects they might have had, intended or otherwise.

2.15 Property Rights and Power

Analysis of property rights should be inseparable from power relations, because property rights are meaningless if they do not prevent the powerful from taking property from the less powerful. The merits of each of the various land tenure regimes seen in Africa—including statutory private property, state’s radical title, and customary tenure—are usually expressed in terms of defending the property rights of the many against the few, or (to make the obvious extension) the weak against the strong. It is a coherent (and not merely sentimental) economic

development scenario to argue that the best way to boost aggregate production, as well as to distribute increased income, is to improve the productivity and the asset base of the many (who, in a society with concentrated power, are necessarily the weak). (Deininger and May 1999 and Deininger et al. 2000 are examples of empirical evidence supporting this point, from an unlikely institutional source.) Advocates of each of these three cited land tenure systems justify their positions as protecting the rights and therefore the assets and productivity, or at least livelihoods, of the many. Those who advocate titled private property claim a need to forestall abrogation of smallholders' rights by powerful moneyed interests or the state ('defensive' titling). Proponents of state's radical title cite the state's patrimonial role in protecting smallholders from the depredations of powerful interests (who may trick or pressure smallholders out of their land if the state did not beneficently govern transfers). Defenders of customary tenure argue that neither state nor powerful interests will uphold smallholders' rights and interests, and the defence of those is best located in small traditional polities that are more responsive and accountable to smallholders. Since each of these three positions has adequate theoretical coherence, deciding which best describes a given country or region is entirely an empirical matter (although this is made more difficult by disingenuousness among interested parties; who after all would admit to being untrustworthy to defend the rights of the weak?)

There are development strategies that are less concerned with diffusion of power, postulating that development (especially rural, agricultural development) is most likely if led by some sort of leading, talented, entrepreneurial group (variously called '*kulaks*,' emergent peasants, or rural entrepreneurs)—'betting on the strong,' so to speak. Accordingly some proposed land rights systems have been more or less explicitly in favour of the strong against the weak, lest such emergent types be held back by excessive tenure security for the weak, thus preventing the (potentially) strong from expanding their holdings and production. (It is now less respectable than it used to be for such development scenarios to speak their name, though they recur and might be the implicit reasoning behind some land tenure reforms, and economic reforms in general.) So land tenure reform touches on at least two broader questions: which development scenario (weak over strong, or strong over weak) actually works? – and, if the former, which land rights system best supports increasing the productivity of the weak?

2.16 Land Rights and Gender in sub-Saharan Africa

Land rights in SSA tend to be strongly gendered. Women generally enjoy fewer and weaker rights than men, whether the women are in male-headed households or are themselves heads of households. Rights of land acquisition, use, and transfer all tend to be more circumscribed for women. Even where land rights are *de jure* non-gender-discriminatory, the discrimination

tends to persist *de facto*. This raises the likelihood of both efficiency and equity losses to rural production, as well both embodying and reinforcing gender subordination. This section, necessarily limited to reviewing a fraction of the large and growing literature on gendered land rights, will review some of their key implications for land tenure reform vis-à-vis poverty reduction.

The situation in SSA has been summarised as women having rights to crops rather than land (Gray and Kevane, 1999). Women may enjoy land use rights, but rarely transfer rights. Furthermore, use rights mostly derive from a woman's relationship with men (as mother, sister, wife, daughter, etc.), rather than deriving from the mode of land acquisition as is often the case with men. The land rights of female-headed households (FHHs) are an important area of concern, though not necessarily more so than women's roles and rights in male-headed households (Tadesse, 2003). Also, marriage is not the only key gendered relationship: so are those of sister-brother, co-wives, and parents-daughters *inter alia* (Tadesse 2003, Peters 2002).

When land becomes scarce or its value rises, or when rights are formalised, women's rights tend to be revealed as secondary and tenuous. Moreover, in situations where rules of access change (as in land tenure reform), men tend to be more successful at arranging their rights under the changed system than women, both because of exogenous factors (the new rules themselves and the ways in which they are administered) and endogenous ones (gender inequalities within households and communities affecting women's ability to approach authority, negotiate under the changed rules, and pay the costs of the process). Where land tenure is being converted from customary to statutory, women thus tend to suffer a double effect, both losing their customary rights and being unable to equally access the statutory rights (Gray and Kevane, 1999).

Because a woman's land rights typically are respected only on the basis of her relationship with a male (most often a husband), divorce and widowhood entail the likely loss of land rights. Expulsion following divorce, and dispossession following widowhood by relatives of the deceased husband, are commonplace.

Although women's land rights are unquestionably inferior and subordinate to men's in most of SSA, they are not non-existent. In Zambia, for example, widows are typically allowed to continue occupying land and farming it after widowhood, especially if their children remain in residence (Machina, 2002). In some ethnic groups in Burkina Faso, limitations on women's land rights are accompanied by the right to a share of the harvest from a husband's fields (although simultaneously, an obligation may exist for women to spend part of the proceeds of their own fields on specified goods for the household) (Kevane and Gray, 1999).

The growing literature on gendered land rights has developed in tandem with a mutually reinforcing area of critique that argues the inadequacy of a traditional assumption, especially in development economics, of the unitary and consensual nature of the household and the homogeneity of its members. Evidence has mounted that households are better seen as loci of competition, bargaining, conflict, and coercion (Agarwal 1994, Tadesse 2003, Manji 2003 *inter alia*). Division of labour is unequal, most obviously along gender lines (Tadesse, 2003), but also along lines of age and class, for example where a successful farmer attracts labour from the extended family or other sources on essentially exploitative terms (Peters, 2002). This, in turn, helps to drive inter-household differentiation: “Here, then, we have the classic cycles of agrarian societies: those without food work for others who can pay them in food but, by working during the cultivation season, they further reduce their ability to produce more next year. They are caught in a cycle of poverty.” (Peters, 2002: 178) Gendered land rights and divisions of labour may be seen as mutually linked and also a key component of long-term processes of change in rural SSA’s productive relations. According to Peters (2002), the conventional characterisation of SSA as land-rich and egalitarian requires qualification: “... over the past 100 years and, arguably accelerating in recent decades, a shift has taken place – from land-rich political economies in which rights over people formed the central political struggle, to a situation of relative land-scarcity and the corresponding struggle to maintain or claim land.” (Peters, 2002: 158-9) Gender issues therefore constitute an intersection of control over two key factors of rural production, land and labour: gendered social relations and division of labour are facets of controlling people and labour, and gendered land rights are a facet of controlling land.

Intra-household allocation of resources, and control thereof, also tends to be gendered and unequal. In an Ethiopian study, although male respondents tended to claim that resources were pooled evenly and decision-making was joint in their households, female respondents claimed that male interests predominated in resource allocation decisions (Tadesse, 2003). In a study comparing Zimbabwean resettlement areas to the settlers’ previous farms in customary areas, women had been allocated sub-plots for their own farming, and part of the general harvest, by their husbands more often on the resettlement parcels than had been the case on customary-land parcels; this may have been due in part to the generally larger size of resettlement parcels (Jacobs, 2000: 9.1-9.2).²⁰ Allocation of household labour inputs, as well as farming outputs, also tends to be unequal: in Zambia’s Southern Province, women were found to be

²⁰ Women in resettlements also expressed some preference for being farther from the patrilineal, patrilocal extended families that exerted considerable control over their households on customary land; the improved food security that generally resulted from obtaining a resettlement parcel was also important (Jacobs, 2000: 4.3).

contributing an average of 6.6 hours in farming labour and 4.1 hours of household labour per day, compared to men's contributions of 5.7 and 0.4 hours respectively (Due et al. 1983: 14, cited in Araki, 2001). Control over other key factors of rural production, such as oxen and implements, is often gender-differentiated as well.

Another aspect of the critique of the assumption of household unity in SSA is that the household's boundaries are too vague, fluid and porous to allow the household to serve as a reliable unit of analysis. For example, in Senegalese customary areas, village lands are divided into compounds, which may consist of several households and many plots. The compound head is almost always male, and allocates land use rights to other households within the compound, typically headed by the compound head's brothers, sons, or multiple wives (Golan, 1994). Such structures may impose constraints on freedom of action with respect to farming decisions for households in the compound, which would be neglected by an assumption of household autonomy. In central Zambia, food security researchers found that the "cluster" (Drinkwater, 1994), the term used to describe a group of producers (households or other types of units) that have close and to some extent reciprocal resource flows, based for example on kinship or polygamy, was the most useful unit of analysis for understanding processes and outcomes related to farming livelihoods. Similarly, a study of poor rural households in South Africa found it most useful to define households as groups with economic or financial relations, rather than conventionally-emphasised relations of kinship or residence, especially in situations of frequent absence in pursuit of employment (Sender, 2002). The "hearth-hold" (Araki, 1997) was a further refinement of these delineations, applied to southern Zambia. The ravages of HIV/AIDS cause fissions and recombinations of 'households'; simultaneously, illness-related decapitalisation and labour shortage put increasing importance on extra-household support networks like clusters (Waller, 1997). These observations suggest that, while the 'household' may still be a meaningful unit of analysis, its meaning is not self-evident and can only be assessed with reference to other structures with which it interchanges resources and members.

The asymmetry between women's and men's land rights can impair both the efficiency of rural production and the equity of its fruits. The equity argument is clear: gendered land rights, and similarly gendered levels of access to other farming inputs, control over labour, and control over farm outputs, harms the welfare of the less powerful gender. The efficiency argument, that production at the household or aggregate level is impaired by gendered land rights (as well as other aspects of intra-household power relations), is more complex. Typically in male-headed households, the main field planted with the staple crop is considered the man's field, while the fields that women control, if any, tend to be smaller and planted with secondary crops like groundnuts, tubers, or vegetables. Yet in most cases, male heads of households

expect women to contribute labour to the ‘men’s fields,’ while reciprocating less than fully if at all. Although the man’s field supplies the household granary (at least notionally), the male head of household’s allocation of farming inputs such as animal traction, seed (if male and female are separately cultivating the same crop), fertiliser, and family or hired labour, is likely to favour his fields at the expense of the woman’s.

This potentially has two deleterious consequences for production. First, sub-optimal land productivity is a possible result of uneven distribution of inputs, for example inadequate provision of inputs for a part of the household’s cultivated area (e.g. a woman’s plot), or sub-optimal timing of labour and animal draught inputs for women’s plots, especially where timing of inputs strongly affects yields (Kevane and Gray, 1999).

Second, a farmer’s labour productivity may be reduced by the lack of control over her own labour allocation. Her labour in her fields may be paired with inadequate inputs; her mandatory work in the man’s fields may derogate her own field’s yield more than it increases that of the man’s field, or it may incur a disproportionate opportunity cost in relation to women’s income-generating opportunities such as brewing; and her work in the ‘man’s fields’ may manifest the same problems of supervision of agricultural labour—opportunity cost for the supervisor, low incentive for diligence on the part of the exploited worker—that many authors have cited as an efficiency argument for the redistribution of large commercial farms into smaller, ‘owner-operated’ family farming units (Manji, 2003; see also Section 2.2 above). Women with insecure tenure over their sub-plots, or their parcels if they are heads of households, also may face the oft-hypothesised disincentive to fixed investment or conservation (as found empirically by Ovonji-Odida, 1999, cited in Hilhorst, 2000) because of the potential loss of investment in case of dispossession. The typical power structure within rural households in SSA, especially with respect to gender, is therefore likely to have considerable effects for household productivity.

Further empirical work on such issues is needed. Is reliance on family labour (i.e. predominantly women’s labour), and therefore a land reform that creates small farms that continue to rely on women’s labour, iniquitous and/or inefficient? Women’s labour on the farm and household may be obtained under supervisory and remunerative conditions harsher than those of wage employment. But the empirical question remains as to whether that makes the labour more or less efficient, since an adequate theoretical argument could be made either way. Also, though unpaid or quasi-unpaid family labour may mostly consist of women’s labour, the two are not coterminous: examples exist where a major factor of farming success is the ability to draw in quasi-paid labour, often male, from outside the immediate household (Peters 2002, Drinkwater 1994).

The preceding discussion assessed the implications of gendered land rights and household structure for production from a static approach. Applying this analysis to a situation of land reform brings a dynamic dimension. How might production and poverty reduction fare, in terms of efficiency and equity, when land reform is enacted in a situation of gendered land rights and unequal intra-household power structures? The foregoing review has already provided reason to expect that unequal intra-household resource distribution means that interventions affect different household members in different ways to differing extents. In other words, because land rights are gendered, as is control over outputs and income, even a land tenure reform that lifts households out of poverty is unlikely to lift all household members out of poverty. Following are some of the prescriptions often cited in the literature for overcoming this.

Target women as co-beneficiaries, and/or target FHHs: In recent legislation in several countries, women's land rights are more explicitly enshrined, though reform of marriage and inheritance laws lags behind, and all are hard to enforce (Hilhorst, 2000). Reforms that may be gender-neutral *de jure* often are implemented in ways that perpetuate or even aggravate women's unequal access to land, because the implementing institutions follow gender-discriminatory norms (e.g. allocating land to men as 'heads of household,' or allocating worse land to FHHs, or applying selection criteria like education in which women are at a predictable disadvantage) (Tadesse, 2003). A positive gender-sensitive reform is needed, for instance registering women as co-owners, or targeting FHHs (Tadesse 2003, Machina 2002). Testacy or inheritance laws, not always considered part of land reform, are in fact especially important because inheritance is the major mode of acquisition in customary lands, and increasingly so on post-independence settlement schemes too as the original generation of settlers from the 1960s and 1970s reaches retirement age. Programmes meant to boost household agricultural productivity (e.g. credit, provision of advanced inputs) should be implemented so as to benefit women farmers.

De facto access to legal and administrative processes and remedies: For women to achieve full *de facto* enjoyment of *de jure* rights, other factors must be addressed, including: women's access to legal mechanisms, information, and political action or organisation; increased social legitimacy of women's land claims; women's access to other sources of support outside those provided by contending claimants to land (e.g. kin); women's access to literacy (which in turn affects access to legal and political mechanisms as well as outside support e.g. employment); and shifts in gender divisions of labour. (Agarwal 1994, Sunde 1997 cited in Tadesse, 2003: 78-79) Some of the barriers to women's enjoyment of land rights, such as the fact that fees, knowledge, and time are needed to negotiate the discretionary bureaucratic process of

obtaining title, should be removed as part of any administrative reform, not just one that is targeted at promoting gender equity. Unintended consequences must be assessed: for example, laws requiring lenders to ensure that female co-borrowers are aware of obligations that their husbands are incurring may impose an additional cost on lenders that discourages them from lending to small farmers (Manji, 2003: 106).

Address discriminatory cultural factors: Beyond improving women's access to political, legal and administrative remedies to the point of equality, cultural factors exist that inhibit women's exercise of rights and livelihood activities, as in Ethiopia, in parts of which cultural taboos exist against women ploughing and sowing (Tadesse 2003: 89-90). Reforms must address enmeshed cultural divisions of property, labour and income, as well as cultural constraints on women's access to extra-household institutions (credit, education etc.) that would help women realise potential productivity gains from land reform, and would afford 'fallback positions' that might strengthen women's bargaining position within households and other arenas of contention over resources such as community and kin.

Consider intra-household division of labour: "...a land reform programme that does not take into account the pre-existing intra-household allocation of labour is likely to increase women's workload without a commensurate increase in women's assets." (Tadesse, 2003: 71). A similar conclusion is reached empirically in a study of Zimbabwean resettlement areas (Jacobs, 2000: 6.3)

"The lesson is that land reform processes that address not only statutory law (and its supporting policies), but also customary and religious law, are critical to enhancing women's enjoyment of their land rights...Factors that would enhance women's enjoyment of their land rights include legitimising women's claims to these land rights through changing gender stereotypes, roles and the gender-based division of labour" (Muthoni Wanyeki, 2003: 28) – as well as changing inheritance laws and access to legal mechanisms. Customary law, though typically embedded in gender-discriminatory social systems, also affords a flexibility that could be turned to advantage in this endeavour. Whether weak states are able to implement such cultural change, with its consequent material effects, will be a key area of future research.

2.17 Conclusions

Land tenure has long been an attractive subject for development theoreticians who looked for systemic explanations for underdevelopment. However at this stage it is difficult to escape the

conclusion that land tenure reform by itself is not the magic bullet that it was once thought to be:

“Within Africa, land titling and registration, especially on a nation-wide basis, has not proved to be an effective approach against poverty, although there may be specific circumstances where it is relevant. These include cases where there has been a breakdown of indigenous tenure systems, where land encroachment by outside interests is common or increasing, and where defensive registration is needed to safeguard individual and group rights....While all are agreed that secure land tenure is important for both poverty reduction and economic development, it is important to avoid simplistic assumptions about how to design arrangements that can best support agricultural development. Over recent decades, top-down, centralised approaches to land and tenure reform have been attempted based on sweeping assumptions—for example that individual private property is the sole foundation for agricultural development, as in Kenya, or, as in Ethiopia, that all land should be owned and controlled by the state, and the rural populace should be given use rights in equal shares. Both of these approaches have generally failed, often undermining security of tenure, and in some cases deepening poverty and allowing richer groups to gain control over valuable resources.” (Quan, 2000a: 48-49)

This review offers two somewhat opposing avenues of critique of the neo-classical model. Detailed descriptions of smallholder farming in Africa and its macro-economic, cultural and political contexts cast serious doubt on the hypothesis that tenure security would overcome other constraints on African agriculture, on the basis of a variety of observations. The diagnosis of insecurity or insufficient individualisation of land rights for farmers under customary tenure turns out to have been a caricature. (Evidence has mounted, meanwhile, that the assumption of unitary household interests is not much better than a caricature, and that insufficient and/or insecure land rights for women, under either customary or statutory tenure, is real and is likely to have deleterious economic effects.) Land is, in many cases, not as scarce a factor of production as labour, animal traction, or short-term inputs. Low uptake of fixed investment may be due to lack of attractive technologies rather than disincentives stemming from putative tenure insecurity. Low credit use reigns, because of both under-supply and risk aversion on the part of even those who could mortgage their land. And titles, even in advanced titling systems like Kenya's, turn out to lack the attributes needed to activate the neo-classical model's economic logic.

Simultaneously, empirical testing to date, while yielding largely negative conclusions, leaves some room for improvement. Study areas and samples must contain enough variation in the key dependent and independent variables to allow confident identification of the effects of land rights. Tenure security should no longer be conflated with related but distinct land rights (such as transferability) that have differential theoretical effects on incentives and opportunities. Land productivity (staple crop yields) should not be assumed to be the only outcome of interest. And the hypothesis that land markets work to transfer land to more efficient users (a hypothesis that requires a more macro-economic approach than the others) remains largely

untested. In view of this it is entirely plausible to continue to suppose that land tenure has economic effects.

Land tenure reform will no longer be seen as a magic bullet to be fired at agricultural stagnation and rural poverty, but the fact that land rights are embedded in cultural practices and power relations does not mean that they have no significant effect on poverty. The debate on land tenure's relation to poverty alleviation in SSA has shifted in recent years from an 'offensive' to a 'defensive' stance. The offensive stance, at its most optimistic, proposed that enhancing tenure security and transferability could cause economic growth, possibly even equitable growth. The failure of empirical validation of this proposal has led the debate to assume a defensive character, arguing that land rights and access to land for the poor and vulnerable must be safeguarded as part of their sustainable livelihoods, especially where policies stemming from the offensive stance undermine smallholders' tenure security by making land alienation possible. While one welcomes the fact that the debate now rests on firmer empirical grounds and with a pro-poor, 'safety first' perspective, one also notes the absence in the current defensive discourse of mechanisms by which land policy might facilitate a broad-based growth of rural incomes.

Chapter 3: THE LITERATURE ON ZAMBIAN LAND AND AGRICULTURE

This chapter aims to locate this study in a theoretical and historical context specific to Zambia. To interpret this study's original data on farming performance and choices, and to relate the eventual findings to the broader land tenure debate reviewed in the previous chapter, it is necessary to appreciate the evolving context within which farmers' choices have been made.

The literature on Zambian economic development, and agriculture in particular, is extensive, and needs to be only selectively summarised here. The literature on land tenure issues in Zambian agriculture is more limited. Zambia, it will be shown, is a land-surplus country where redistributive issues have mostly not been acute but where tenurial issues recur. Post-Independence land tenure policy was an amalgam of tacit recognition of customary tenure together with the abolition of freehold on state land in favour of weak leases. The country's large mining industry provided both means and motive for extensive state intervention in agriculture—means in the form of revenue, and the motive being the necessity to produce enough food for the burgeoning urban workforce. Plummeting copper prices in the 1980s made such largesse untenable even as it also became unfashionable, and a new government in 1991 began to re-orient both land and agriculture policy in the direction of privatisation and free markets, to enthusiastic reviews from some international donors. Since then, governance concerns and chronic exogenous shocks such as recurrent drought and cattle disease have taken the lustre off Zambia's market-oriented reforms, though some gains are noted.

The chapter begins (3.1) with a summary of Zambian national agricultural policy (because of its links to land policy) and performance in the post-Independence period. Next, Zambia's national land policy framework is explored (3.2) from the pre-Independence period through the Lands Act of 1995 and its (as yet incomplete) aftermath. The study area of Southern Province is then explored in detail (3.3), examining its farming systems and land policy and practices, especially highlighting the distinctions between customary land and settlement schemes on state land (which will form the two major strata of this study). Lastly (3.4), the most directly relevant previous studies on Zambian land and agriculture are reviewed in detail.

3.1 Zambian Agriculture: National Policy and Trends

3.1.1 Post-Independence Agricultural Policy (1964-1991)

With a large urban populace and mining workforce, the question for Zambian agricultural policy has long been how to grow and market enough maize to feed the urban populace at

affordable (and politically popular) prices. The post-Independence government intervened heavily in agriculture, using incentives for maize production (guaranteed pricing for producers, aggressive provision of advanced inputs such as hybrid seed and fertiliser, establishment of settlement schemes on unused land) as the main mechanism. In effect, the government was promoting a 'green revolution' for small and medium-sized farmers, in the form of advanced inputs (though mostly without irrigation). Price incentives operated on both inputs and outputs, with subsidised prices, deliveries of and credit for hybrid seed and fertiliser, and (from 1975) pan-territorial producer prices that were especially favourable to remote producers. The approach has been aptly termed "a political settlement, that has been referred to both as a social contract...between farmers and the state, and as a 'mass public sector outgrower scheme' (World Bank, 1996:31)." (Copestake, 1997b: 14)

Inevitably in such a centralised system, inefficiencies were rife. Pan-territorial producer prices and centralised milling caused unnecessary transport away from local markets and encouraged maize cultivation in areas better suited to millet or cassava. Macro-economic factors such as rising exchange rates stifled sectors like cotton and tobacco where Zambia should have had comparative advantage. Monopsonistic marketing institutions were badly managed. The foreign exchange deficit occasioned by falling copper prices brought the UNIP (United National Independence Party) government into negotiations, starting in 1983, with the IMF (International Monetary Fund) and World Bank, one of whose chief targets was the government's spiralling spending on maize subsidies. The GRZ (Government of the Republic of Zambia) responded with some reforms, but frequently had to backtrack under domestic political pressure. The agrarian problem was exacerbated by apparently under-supplied rural labour markets: "There is little popular enthusiasm for 'rural resettlement schemes', while commercial farmers complain of labour shortages (with urban unemployment estimated at over 50 per cent) and the President and Party are openly discussing the possibility of amending the constitution to enable forced resettlement." (Kydd, 1989: 140)

3.1.2 After the 1991 Elections

The MMD (Movement for Multi-party Democracy) victory in the 1991 elections, after 27 years of UNIP government, heralded policies with a more free-market orientation. Within five years, most prices and restrictions on private sector trade were removed, though liberalisation was complicated by the slowness of the private sector to fill the resulting gaps in marketing and service provision, and by concurrent severe droughts (Copestake, 1997b: 17). National producers and suppliers of fertiliser and seed lost their monopoly positions and were wholly or partly privatised. The loss of subsidy for purchase of seed and fertiliser led to a contraction of

the number of farming households purchasing these inputs and of their overall sales between 1990 and 1994 (Copestake, 1997b: 18).

Whereas before 1991 most smallholders obtained credit through government-supported lending institutions, liberalisation removed such financial support. Moreover, the liberalised marketing system meant that farmers were no longer obliged to sell their maize through co-operatives, which had also functioned as the government's in-kind loan collection agencies, so default rates increased. Nor did smallholders find much help in the private banking sector: "...they could not obtain loans from commercial banks which demanded high interest rates and collateral." (Oxfam-GB, 1999: 5-6) Small farm finance is labour-intensive: a lender needs staff and transport to penetrate the rural areas and identify credit-worthy farmers if it is to avoid heavy defaults, and the post-liberalisation lenders lacked such resources. Political interventions in credit operations also encouraged farmers to believe that loan forgiveness was likely and made seizure of collateral by banks unpopular (Copestake, 1997b: 18). By 1999, few farmers were managing to obtain credit, the credit was heavily maize-focused, in-kind repayment conditions were unattractive, and deliveries of inputs on credit were often late. (Oxfam-GB, 1999: 21-22)

For transport and marketing, the post-1991 policies aimed to dismantle the state-run system and encourage private traders to take its place. This too was easier in theory than in practice. For example, entry of would-be traders into the business was hampered in 1993 (during a bumper harvest, moreover) by unusually tight credit imposed to meet anti-inflation targets (Copestake, 1997b: 19). On the positive side, dismantling the government's milling and marketing monopoly (which operated via centralised regional depots) did remove the often-inefficient necessity of transporting maize away from local markets for milling, then transporting it back for sale (Copestake, 1997b: 19).

It may be too soon to assess the impact of policy on agriculture since 1991, because of the difficulty of isolating exogenous factors such as drought and catastrophic cattle disease. But some trends are clear, if their attribution is not. According to annual national post-harvest surveys, annual area under maize cultivation fell by 165,000 hectares (ha), equivalent to 22%, from 1990 through 1999 (Zulu et al., 2000: 8). The decline in national maize area is most marked in remoter areas that had benefited from pan-territorial pricing (Zulu et al., 2000: 31), and therefore is a retreat from the inflated levels created by pre-1991 subsidies.²¹ Some maize cultivation has been replaced by more drought-tolerant crops like millet, cotton, and cassava (facilitated by government, out-grower, and donor programmes), as well as by groundnuts and

²¹ Interview with Sylvester Kalonge (Agricultural Officer, USAID), 21/9/2001, Lusaka.

sweet potatoes (Zulu et al., 2000: 20). Input use among smallholders has fallen (by 40% from 1982-5 through 1991-4) (Copestake, 1997b: 19). The national cattle herd has fallen from “a peak of 1,876,000 in 1983 to 1,149,000 in 1992 and just 787,000 in 1993. The fall has been particularly spectacular in Southern Province - from 1,009,000 to 272,000 over the same ten year period.” (Copestake, 1997b: 19-20) Subsequently, cattle herds recovered somewhat to 1,222,000 head as of September 1997, but again declined sharply to 1,016,000 just one year later (Zambia, 2000: 21). Most of the decline has been due to the tick-borne ‘corridor’ disease (a variant of East Coast Fever); but droughts, distress sales, and deterioration of veterinary services (especially anti-tick cattle dipping) also contributed. Government investment in agricultural infrastructure and services intensified from 1996 with the \$350 million Agricultural Sector Reinvestment Programme (ASIP) (Copestake, 1997b: 21). However it was plausible to expect that benefits from an invigorated agricultural sector would accrue unevenly, favouring those already advantaged geographically or socio-economically (Copestake, 1997b: 27).

There are reasons to be cautiously optimistic about Zambian agriculture:

“Compared to many of its neighbours, Zambia still has a relatively favourable natural resource endowment. This has remained under-exploited through a combination of low population density, the structural orientation of the economy towards copper and urban development, and policies that until recently wedded farmers' livelihoods more to the vagaries of state patronage than to those of private markets. With almost complete liberalisation of the sector, the conditions are now in place for more sustainable agricultural growth. This is likely to continue to be constrained in the medium term by the weakness of public infrastructure and to be dominated by richer farmers with better access to markets.” (Copestake, 1997a: 48)

Ten years on from liberalisation, observers will be keen to assess whether Zambia's private markets are indeed less vagary-prone than its state patronage.

3.2 National Land Framework

3.2.1 Pre-Independence

The prime feature of Zambia's national land framework is the division between State (formerly Crown) land and customary (formerly Reserve or Trust) land, a dualism that dates from the 1928 Northern Rhodesia Order in Council that “formally established areas of crown land to be reserved for white settlement under English Land Law and reserve areas for African occupation under customary tenure arrangements.” (Roth et al., 1995: 4) The establishment of Crown land led to the forcible removal of its owners to the designated reserves (Roth et al., 1995: 4). The 1928 Order left large parts of the territory unclassified, “set aside for the anticipated influx of white settlers that never materialized.” (Roth et al., 1995: 4) Consequent

overcrowding in the reserves and idle unclassified land led to the 1947 Northern Rhodesia (Native Trust Land) Order in Council, which designated much of the un-colonised land (about 100 million acres) as 'Trust Lands' thus held for 'native Africans.' "By 1950, the crown land reserved for Europeans had shrunk to 4.6 million acres, while the land reserved for 'Africans' (Reserve and Trust Lands) had increased to around 171 million acres." (Roth et al., 1995: 4) After World War II, white settlement did accelerate somewhat, resulting in a total of over 1000 white farms by the 1960s (Roth et al., 1995: 5). At Independence in 1964, Crown land was re-named State land, while Reserve and Trust Land retained their classifications.

Some lingering features of Zambian land policy that may seem at first glance to stem from the socialist goals and methods of the UNIP government of President Kenneth Kaunda (such as abolition of freehold in favour of leasehold) in fact date from colonial government policy. It was then that official preference for leasehold over freehold first emerged: "...prior to the 1930s, allocations of crown land involved mainly freehold property. Beginning in the 1930s, more and more settlers were granted long-term leaseholds rather than freeholds, giving way entirely to leaseholds by 1944." (Roth et al., 1995: 5) It was felt that the leasehold system allowed greater control by the state over land and its use: "Extensive changes in the ownership of state agricultural land accompanied the Land Ordinance in 1956 that introduced the concept of 'progression' whereby a farmer who performed satisfactorily could upgrade tenure from leasehold to freehold." (Roth et al., 1995: 15) Zambia's post-Independence land policy (see below) may seem a reversion to indigenous African land principles, or a progression towards socialist principles, away from freehold which seemed to be a colonial and Western capitalist imposition. But this history clearly shows that the post-Independence policy (like 99-year leases and the enticement of tenurial 'progression' or upgrading as the state's means of enforcing satisfactory land use) had colonial antecedents.

3.2.2 Land (Conversion of Titles) Act (1975)

The major post-Independence land law, changing previous regimes, was the 1975 Land (Conversion of Titles) Act, commonly referred to as the Conversion Act:

"The...Act...vested all land in Zambia absolutely to the President...and converted all freeholds into leaseholds...not exceeding 100 years...Upon expiry, a lease may be extended for a further 100 years or less as the president may see fit...Lessees are not entitled to assign, sublet, mortgage, charge, encumber, or part in any way with the holding without the prior written consent of the president in writing...The president is also granted powers of fixing the maximum amount to be received, recovered, or secured for land...However, in fixing prices, the president must disregard any value of land apart from the unexhausted improvements thereon...Thus, idle land without improvements cannot have value, and the benefits of investments in land accrue to the leaseholder, but not the value of the land created by location or presence of public investment. Mortgages on land are possible but only on the value of unexhausted improvements on the land...Also, the lessee is not allowed to let the land remain idle

for a period of more than three years except with written consent of the lessor.” (Roth et al., 1995: 16)

3.2.3 Other Land Legislation

The Lands and Deeds Registry Act of 1914 and the Land Survey Act of 1960 were still in effect by 1995. The former requires that every lease of more than one year be registered; the latter specifies the survey procedures that must accompany application for long lease. Between the two Acts and the numerous ministries and sections responsible for implementing them, as well as high survey standards that seem excessive for low-density farmland or ranchland, the procedures for obtaining or transacting a lease were cumbersome and inordinately time-consuming (Roth et al., 1995: 17).

The Lands Acquisition Act of 1970 provided for government expropriation of land at the discretion of the president. Compensation was to be for unexhausted improvements only, assigning no value to the land itself. “This [A]ct has been severely abused in the past as government has expropriated land with inadequate levels of compensation, in some cases for public works, but in other cases for reallocation to private individuals. Charges of fraud, corruption, and bribery have been widespread in association with the implementation of this act.” (Roth et al., 1995: 18)

Law concerning non-State land has followed a somewhat different track:

“Until repealed by the *Lands Act* 1995, the *Zambia (State Land and Reserves) Orders* 1928 to 1964 governed the administration of Reserve Land. Under these orders, the land was set apart for the sole and exclusive use of the indigenous peoples of Zambia, although the President could make grants of land to Zambians and rural councils for periods up to 99 years...While Zambians and District Councils could own title [*i.e.* 99-year lease], non-Zambians were also allowed to do so provided that they qualified as investors or were approved by the President, who normally made such grants in the form of leasehold. Either by oversight or design, the laws governing the granting of Reserve and Trust Land by the President (in effect the Commissioner of Lands) were not repealed by the *Land (Conversion of Titles) Act* 1975. The practical effect was that land matters in Reserves and Trust Lands continued to be interpreted in the light of the Orders of the colonial government.” (Adams, 2003: 7-8)

It was (and is) legally unclear whether a parcel of customary land for which a lease is granted remains customary or is permanently redefined as State land.

Either way, titling was not for the many:

“The current titling system, which is in theory open to traditional farmers in the rural areas, is by reasons of expense and complexity really open only to the relatively wealthy, well-informed, and influential. It is exceptional for traditional farmers to apply for or receive titles. The system as it is now working is not solely or even primarily a system for providing title as evidence of rights to land, but a mechanism for taking land away from communities which customarily have had access to it and

allocating it to new governmental and commercial elites, both Zambian and foreign.” (Bruce et al., 1995: 64)

3.2.4 The Lands Act (1995)

After 1991, the new MMD government had an opportunity to effect its expressed pro-market principles with a new land law. Removing the prohibition on land valuation and sales was one obvious possibility. More controversial possibilities included re-introducing freehold, spreading statutory tenure onto customary lands in one guise or another, re-classifying Reserve and Trust Lands, simplifying titling procedures, and divesting the presidency of authority over all land. It was a difficult debate for a new government to embark upon, touching as it did on entrenched interests (not least the government’s own), sentiment, and related economic reform issues such as the proposed privatisation of mines (which controlled large and populous surface areas). Rows ensued between the government and chiefs, who perceived a derogation of their authority over customary land, and in Parliament, where the first Bill had to be withdrawn. The final version of the act fully satisfied neither advocates of privatisation nor chiefs, and generally strengthened the state’s hand:

1. “It repealed *The Land (Conversion of Titles) Act* 1975, yet all land continues to vest in the President who is required to give consent to a person who wishes to sell, transfer or assign any land.” (Adams, 2003: 9)
2. Unlike previous laws, the Act explicitly recognises customary tenure, “although any person who holds land under customary tenure may convert the holding to a lease (State Land), not exceeding 99 years, or any other title that the President may grant.” Also, the Act “states that the President ‘shall not alienate any land situated in a district or an area where land is held under customary tenure without taking into consideration the local customary law on land tenure ... *[and]* without consulting the chief and the local authority in the area in which the land to be alienated is situated ...’ (GRZ, 1995, p. 271).” (Adams, 2003: 9)
3. The Act recognises that land *per se* has value (undoing that aspect of the 1975 Conversion of Titles Act) and permits land sales. (Adams, 2003: 9)
4. The Act repeals previous laws and orders-in-council to consolidate Reserves and Trust Lands into a new land category, ‘Customary Area.’ (Adams, 2003: 9)

Opinions on the new land law are decidedly mixed. It has been praised as a step towards empowering small farmers (Kajoba, 1998). It may also cause mass tenure insecurity in areas like the Copperbelt, where ZCCM (Zambia Consolidated Copper Mines) owns extensive lands farmed by squatters who may be displaced as the mines are privatised (Hansungule et al., 1998). Although the 1995 Act for the first time explicitly recognises customary tenure, chiefs

were not slow to note that their power to block government grants of leasehold on customary land has been downgraded from ‘consent’ (1975 Land Act) to ‘consultation’ (1995 Lands Act). In some quarters it was felt that this was a thinly-veiled government plot to appropriate or sell off customary land at will. One chief in Mazabuka District considered the act to be ‘empty propaganda,’ and positively advocates smallholder titles on his land as a defensive measure against the government granting the land to someone else.²² Chiefs, inspired by the Lands Act, may take advantage of the new legality of selling land: the Act, by facilitating government alienation of customary land, gives chiefs an incentive to sell land off before the government can alienate it—i.e. to profit from it before someone else does.²³ Others challenge the rationale of the law, holding that customary tenure does not obstruct increased productivity (Sjaastad, 1998: 290). On a practical level, the GRZ did not publish draft regulations based on the new law till November 2002,²⁴ meaning that it has yet to be implemented (Adams, 2003: 10). Others are dismissive of legislation that offers no stronger instrument than the 99-year lease, whose equivalence to freehold title is “a myth.”²⁵ Zambian banks that accept a 99-year lease as collateral are really only interested in assets above ground. There is yet no real land market, so banks cannot reliably sell off what they repossess. Titling as practised in Zambia, one observer emphasised, is a discretionary administrative or political procedure, which makes it an opportunity for corruption; it should be quick, cheap, and non-discretionary. Rejection of freehold is a holdover not from tradition, but from socialism.²⁶

Considering that by 1995 the MMD government had already reversed many major agricultural and economic policies of the previous government, its Lands Act contains milder changes than might have been expected. It did not introduce the possibility of obtaining leases for customary land—that was already possible under previous legislation.²⁷ It does not re-introduce freehold, nor any stronger statutory instrument than the 99-year lease. It does not significantly streamline the procedures for obtaining 99-year leases (aside from promising to open a Ministry of Lands satellite office in Copperbelt Province). It continues to vest all land in the President.

²² Interview with Chief Mwanachingwala, 21/8/2001, Mwanachingwala (Mazabuka District).

²³ Interview with Charles Dinda (Co-ordinator, Law & Development Association [LADA]), 20/8/2001, Monze.

²⁴ Zambia, 2002.

²⁵ Interview with James LaFleur (Executive Director, ZATAC), 13/9/2001, Lusaka.

²⁶ Interview with James LaFleur (Executive Director, ZATAC), 13/9/2001, Lusaka. This opinion partly contradicts the historical record which shows that the movement from freehold to leasehold on State land actually started in the colonial period; however it may be valid to the extent that robust, durable, and individual (or at least familial) land rights under Zambian customary land law have been well documented.

²⁷ Although, as mentioned, requiring chiefs’ consent, not mere consultation.

At the time of this study's fieldwork in 2001, the new Act was not yet implemented, since no policy or regulations had yet been published. This study therefore does not concern the effects of the new Act (interesting though such a study will eventually be); it concerns conditions that arose under previous legislation and were not yet discernibly altered in the six years since the passage of the new Act.

3.2.5 Summary

Zambia inherited a colonial division of the territory into Crown land for European settlement under English-derived law (mostly in strips of good agricultural land along the line of rail) and Reserve and Trust lands for 'natives' under customary law. The limited extent of State (ex-Crown) land and European settlement prevented land redistribution from being a pressing post-Independence issue, though there was localised land pressure in prime farming areas like Southern Province. The Kaunda government moved land law away from private ownership (replacing freehold with leasehold) and commercialisation, while maintaining the dualism of State and customary land and their distinct tenure regimes. The post-1991 MMD government passed a new Lands Act in 1995 as part of its series of free-market reforms, although despite its reputation the Act makes only slight changes to the existing regimes, and as of this writing has not been implemented.

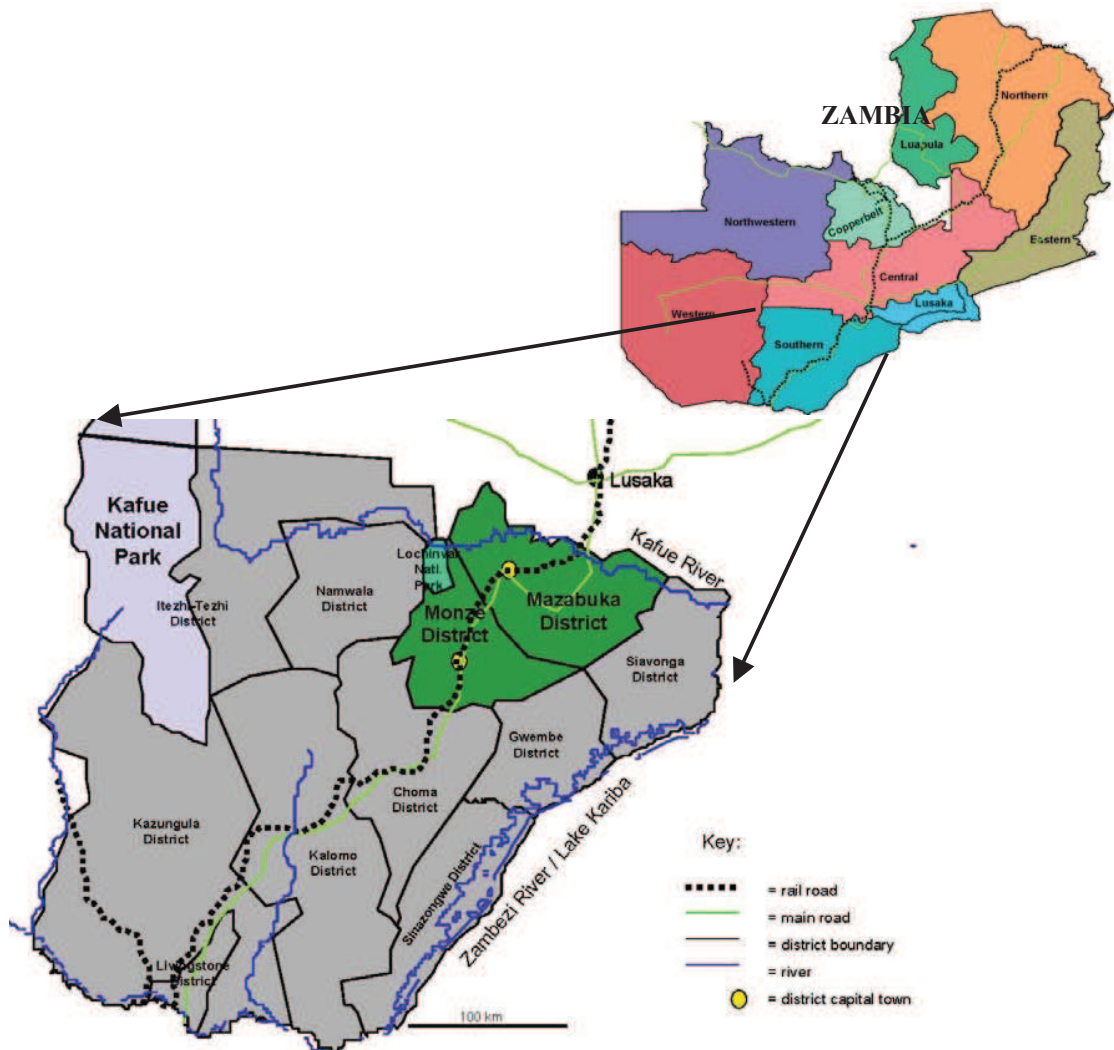
3.3 Southern Province and the Study Area (Monze and Mazabuka Districts)

Monze and Mazabuka Districts (shown in Figure 3.1) occupy the Tonga Plateau (which comprises most of Southern Province) and straddle the line of road and rail between Lusaka and Livingstone. Monze District comprises 485,362ha, of which approximately 135,000 ha are State land (including 41,000 ha Lochinvar National Park, 600 ha Monze and Chisekesi townships plus railway land, 35,440 ha settlement schemes, and 55,560 ha commercial farms) (Zambia, 1985: 36). District population according to the 1990 census was 126,039 (Zambia, 1995b).²⁸ Mazabuka District comprises 624,200 ha, of which 229,400 ha is State land (including 153,000 ha private commercial farms, 21,200 ha State farms, 50,900 settlement schemes and co-operatives, and the balance comprising townships and railway land plus a 210 ha forest reserve) (Zambia, 1985: 18). Mazabuka district population in 1990 was 155,436 (Zambia, 1995b). Together, the two districts comprised 31 per cent of Southern Province's population of 907,150, which in turn was 12.3 per cent of Zambia's population of 7,383,000. Monze and Mazabuka towns are relatively major agricultural trading centres, being on one of

²⁸ District-level data from the 2000 census were not yet available at the time of writing.

the country's main transport routes and surrounded by large and medium-sized farms. Most of the area is at an elevation of about 1,000 metres.

Figure 1.1: Map of Southern Province²⁹



Because the general approach of this study is to contrast land tenure and agriculture on settlement schemes with that on customary land, a detailed chronicle of each in the study area is presented in the following sections. First, a summary is given of Southern Province farming: its agrarian structure and evolution thereof, and its major crops, assets, input use, and preferences as contrasted with those in other Zambian provinces.

²⁹ The author is indebted to A. Lyons who has made his Zambia map-making software freely available via the internet, on <http://nature.berkeley.edu/~alyons/zm/mapping.html>.

3.3.1 Profile of farming in Southern Province

3.3.1.1 *Agrarian structure*

Agrarian structure in Southern Province has moved over the past century towards increased differentiation,³⁰ a process in which the state and technological changes have been pivotal (Chipungu 1998). The adoption of the plough and animal traction (displacing the hand hoe), and later the introduction of advanced inputs such as hybrid seed and fertiliser, enhanced differentiation between those able and unable to take up these technologies. State policy, both colonial and post-colonial, facilitated differentiation by supporting ‘emergent’ small commercial farmers (especially by means of settlement schemes—see Section 3.3.3 below) and intervening aggressively in markets for agricultural inputs and outputs. These two important factors in differentiation interacted with each other and with macro-economic factors such as the emergence of the mining industry and consequent high urban demand for staple crops, and later the mining industry’s gradual decline and concomitant contraction of government spending for agricultural support and increased emphasis on export crops (to replace foreign exchange previously generated by minerals).

State policy, even under avowedly egalitarian UNIP governments, usually went in the direction of supporting differentiation either deliberately or incidentally. “As long as the conditions of appropriating wealth exist through organization of the production process (i.e. allocation of labour, changes in productive forces, etc.) and marketing facilities, differentiation is likely to result regardless of the mood of the state...However, when and where the state chooses to intervene, can affect the pace of differentiation.” (Chipungu, 1988: 6) For example, farmers’ uptake of new technology was conditioned by the ability to mobilise capital; and until the 1950s, such capital had to be generated within the extended family, from commodity sales or wage employment (Chipungu, 1988: 230). Starting with the colonial government’s agricultural schemes in the 1950s, some formal credit was available to ‘African’ farmers, increasingly so until the economic crisis of the 1980s. The fact that colonial-era state-led agricultural promotion schemes (e.g. the Southern Province African Farming Scheme) targeted only certain responsive segments of the farming population and granted them intensive support (extension services, credit, subsidies on equipment purchase) helped to create or enhance differentiation (Momba, 1989: 336). Even after independence, provision of credit by commercial banks favoured the strong. The Credit Organisation of Zambia was created in 1967 to lend more broadly, but was dissolved in 1970 because of financial trouble and replaced by the Agricultural Finance Company, which examined applicants more strictly. Unequal access to credit affected unequal access to hybrid seed and fertiliser, and hence

³⁰ Although, as Araki (1997) warns, an undifferentiated, idealised past should not be assumed.

deepened differentiation (Momba, 1989: 336-337). The economic crisis of the 1980s constrained the state's ability to subsidise agricultural production, and what subsidies remained tended to concentrate even more on richer peasants (Chipungu, 1988: 206).³¹

Geographical factors also influenced differentiation: “[From the 1930s] Peasants near headquarters of extension camp services and farmers' centres or agricultural stations in particular were likely to benefit more from the technology provided by the state than those far away. Rich and middle peasants tended to be concentrated around such agricultural infrastructures, and poor ones farther away.” (Chipungu, 1988: 230) Gender differentiation accelerated as well: state-sponsored technology and credit tended to be handed exclusively to men, thus weakening women's position within households, even though they may have been the primary users of the technology as they supplied most labour in household farming (Chipungu 1988, Kumar 1994).

Differentiation was already discernible in the 1930s and 1940s, according to contemporary governmental reports (cited in Momba, 1989: 335-336) that identified large differences in Mazabuka District households' areas cultivated and incomes. More recent and detailed data from the 1997-1998 season indicate that the top quartile of farming households in Southern Province cultivated an average of 0.79 ha per capita, versus 0.07 ha per capita for the lowest quartile, making it the province with the third-highest concentration of cultivated land in Zambia by this measure (only slightly behind Lusaka and Central Provinces) (Zulu et al., 2000: 27). In terms of value of crop production, Southern Province is the most concentrated (narrowly ahead of Central and Lusaka Provinces), with the top quartile producing an average value ten times greater than that of the lowest quartile (Zulu et al., 2000: 29).

Yet differentiation has not been uniform, unidirectional and irreversible. The caprice of adversity like epidemics of cattle disease (and indeed human disease such as HIV/AIDS) could impoverish the relatively wealthy almost overnight (Araki, 1997: 201). State policy had its own vagaries and contradictions, for example the socialist UNIP government's embrace and support of small capitalist farmers on settlement schemes, an effort that, ironically, dissolved into neglect by the subsequent pro-capitalist MMD government. Persistent kinship-based systems of allocating and sharing labour, oxen, implements, and other inputs slowed the commoditisation of agricultural systems, as did customary land tenure which militated against ever-expanding heritable farming estates (Chipungu, 1988: 48-49).

³¹ Nelson-Richards (1988), studying a parastatal company's tobacco outgrower scheme in Western Province, also points out the irony that the UNIP government, which had “vowed to eradicate capitalism and put an end to exploitation” now “promoted local capitalist exploitation” (Nelson-Richards, 1988: 47) by targeting the larger, emergent farmers and facilitating their increasing use of wage labour and consolidation of their locally dominant position.

Has differentiation produced discernible classes? Momba (1989) searched for patterns in political behaviour among what could be considered peasant classes (rich, middle and poor peasants, defined according to whether surplus exceeds, meets, or falls short of requirements). He estimates that the interests of rich and poor peasants in Southern Province do not diverge much: rich peasants have heavy interests in cash crop production and animal husbandry, while poor peasants aspire to the same and therefore support rich peasants' efforts to promote government support for such activity. UNIP's rival party in the early post-Independence years, the African National Congress (ANC), heavily based in Southern Province, encouraged the fear among rich peasants that UNIP would redistribute their wealth; and indeed rich peasants did find their interests undermined by some UNIP measures, like the promotion of co-operatives. (The ANC in its day did relatively well electorally in Southern Province's Monze and Mazabuka Districts, due to the concentration of rich peasants there according to Momba.³²) A polarisation may be emerging between households that depend on low agricultural wages to survive, and those that benefit from such a cheap pool of labour, tending to reinforce and widen income inequality (Geisler, 1992).³³

However, the movement of agrarian relations towards commoditisation (of land, labour, inputs and outputs) has been fitful and incomplete. In the 1950s, 'rich' peasants still relied heavily on family and community labour, often offering use of implements and oxen in return (Chipungu, 1988: 48-49). Non-commoditised allocation (mostly kinship-based) of labour, oxen, seed, and fertiliser persists: many households, male-headed as well as female-headed, continue to depend heavily on 'borrowed' labour; such interchange among households (and hearth-holds) peaks at key farming times (Araki, 1997: 164). Sjaastad (1998) found very few land sales in study areas in Southern and Northern Provinces but many 'reciprocal' transfers of land and other factors (e.g. oxen use etc.), including fertiliser for labour. In lieu of a functioning formal land market, and given the disappointing state of formal factor markets and their governmental substitutes, such non-commoditised reciprocal flows continue to be important.³⁴

Technology intersects with gender to change the intra-household division of labour and resource allocation. Colson (1958, cited in Araki 1997) argued that the replacement of hoes

³² Momba concludes that these patterns evince that, although analysts should not try to show classes where they do not exist, class analysis is still possible and useful to discussions of rural Africa's political economy even where distinct classes have not yet emerged; moreover, Bernstein (2004) argues that there can be class dynamics at work that for various reasons do not produce clear-cut classes.

³³ This also recalls what Peters (1994: 178, cited above in Ch. 2, Section 2.16) called the "classic cycles of agrarian societies." Sender (2002) and Sender and Johnston (1995), using data from South Africa, point out the perhaps surprising importance of wage employment to the survival strategies of the poorest rural households, and of the women therein.

³⁴ Although Geisler (1992) and Peters (1994), cited above, suggest that such 'reciprocal' flows may hardly represent equal exchange.

with ox-drawn ploughs reinforced men's rights over fields and crops: "Because the plough and oxen used in the fields are commonly his, he claims that he is entitled to all the proceeds over and above what is needed for food" (Colson, 1958: 112).

In an Eastern Province study covering 330 households (Kumar, 1994), women were found to provide nearly 60 percent of family labour in agriculture.³⁵ However, men have superior access to hybrid seed, and therefore control over the crop: "Women have less involvement in hybrid maize than in any other crop, with only 25 percent of area being independently or jointly managed by women. Moreover, adoption of hybrid maize by a household tends to reduce women's share in crop management and agricultural decision making, independent of farm size. This may be because women have less access to resources such as credit, inputs, and human resource improvements, which are essential for producing the new crop varieties, or it may reflect men's desire to control income from cash crops." (Kumar, 1994: 3)³⁶

Women's and children's share of labour (percentage contribution of total labour input to a certain crop) is lowest for the most commercialised crops (hybrid maize, cotton, sunflower), and higher for local maize and groundnuts (Kumar, 1994: 55). Even so, share of labour for groundnuts was 53% from women and 12% from children (Kumar, 1994: 55)—indicating that despite groundnuts' reputation as a women's crop, it is far from exclusively so, as men still contributed a 35% labour share. In Southern Province, women's own plots tend to contain groundnuts, sweet potatoes, and/or vegetables; women have more discretion over income from these crops than that from field crops (Araki, 1997: 209-210).

As farm size increases, men's agricultural labour input increases mildly, but this is more than offset by decreases in their inputs into other categories of labour use (e.g. off-farm employment and business activities). Women's labour, by contrast, increases with farm size, in both agricultural and household maintenance categories (Kumar, 56-57).³⁷

Control over crop outputs and resulting income flows from control over inputs:

"Access to income from crop sales within the household is clearly indicated as a function of the crop ownership pattern, with the primary owners receiving the bulk of proceeds. Where men and women jointly own the crop, women receive only 30 percent of income from sales. This figure is more likely to reflect the extent of

³⁵ Similar proportions were obtained in the study in three provinces including Southern Province by Due et al. (1983: 14) (cited above in Section 2.16), who showed that women spent 6.6 hours per day in agriculture in contrast to men's 5.6 hours per day, as well as 4.2 hours per day on household activities, *versus* men's 0.4 hours.

³⁶ Somewhat ironically, men's control over hybrid maize increases their labour input in households where it has been adopted (Kumar, 1994: 3).

³⁷ This echoes the observation of Jacobs' (2000) female respondents on resettlement schemes in Zimbabwe (cited in Ch. 2, Section 2.16), that the settlements' larger farm sizes caused them more work.

women's management decisions than their labor input. To what extent a bargaining process was involved in this division of proceeds could not be identified, but it is likely. Intrahousehold expenditure patterns confirm that women's expenses are virtually all for either food or for maize milling, indicating a high propensity for food-related expenditures." (Kumar, 1994: 76-77)

All in all, "Gender-blind development is clearly not achieving gender-neutral effects" (Kumar, 1994: 69).

In conclusion, this section has offered some illustrative glimpses of the deepening though not constant rural differentiation that Southern Province has experienced in the 20th century. Differentiation has been discernibly facilitated by state policy, the macro-economy, and technological changes. In ways probably similar to much of SSA, most Southern Province farmers continue to access inputs and distribute outputs by means of social and not just market or statutory relationships. Gender division of land rights (and of property, income and labour in general) has been found to be marked in Southern Province as well as elsewhere in rural Zambia.

3.3.1.2 Crops, assets, inputs, and preferences nation-wide and in Southern Province

Annual post-harvest surveys collect data from approximately 7,500 households country-wide, thus profiling Zambian farming and its variations across provinces. The most recent available data (for the 1997-98 season) estimate a total of 921,061 rural households in Zambia (115,893 in Southern Province). 70% of households grew maize (not necessarily exclusively), 40% grew cassava, 39% grew groundnuts, and 19% grew millet (Zambia, 2000: 2). "The total area planted to various crops was 1.19 million hectares. The area planted to maize accounted for 44% of the total area planted to crops that season. In second place was cassava which accounted for 23.6%, and third was groundnuts under 10.1%." (Zambia, 2000: 3) 30.2% of maize-growing households used animal draught for land preparation (Zambia, 2000: 9). 17% of maize-growing households applied basal fertiliser, and 18% applied top-dressing fertiliser. (Zambia, 2000: 3) Only 5% country-wide used organic fertilisers (animal manure or green manure), though the figure was higher in Southern Province (18%). (Zambia, 2000: 6) "Marketed maize was 21.2% of the total produced." (Zambia, 2000: 14)

LIVESTOCK:

"A total of 115,927 households...raised cattle during the 1997/98 agricultural season [*i.e. 13% of all farming households nation-wide*]. The total cattle population at the end of the season was estimated at 1.0 million herds [*head*]. This cattle population was 20.3% smaller than the number reported to have been held at the start of the agricultural season. There were an average of 9 cattle per household that raised cattle during the season." (In Southern Province, 33% of rural households reported raising some cattle.) (Zambia, 2000: 21)

CREDIT:

“Only 11.5% of the 897,197 agricultural households applied for loans from the formal sector. Across the provinces, Eastern Province recorded the highest percentage of agricultural households applying for loans at 27.1%. The second highest percentage was recorded in the Central Province (15.4%), followed by Southern Province (12.7%)...A total of 103,155 households applied for agricultural loans, and 67% of these received loans...Eastern Province recorded the highest percentage of households that received loans (93.1% of the households that had applied for loans) followed by Central Province (59.6%). No loan applicant in Luapula and North-Western Provinces received any loans...At national level, 81.6% of the households that received loans obtained them from out-grower facilitators, mostly organizations that promote the growing of seed-cotton and tobacco [72% in *Southern Province*]...Private credit agents were the major source of financing in Lusaka Province amounting for 47.4% of the households that received loans. For Western Province the major source was NGO's accounting for 60.2% of the households.” (Zambia, 2000: 26)

DESIRED INVESTMENTS: Respondents were asked what sorts of investments they were interested in making as a household (as opposed to on a community basis). A plurality of households (45.6 per cent)

“...preferred to invest in livestock, as individuals. The next most desired investment by individual households was in farm implements, reported by 20.3% of the total households. In Central, Eastern, Lusaka and Southern provinces, 50% and more of the households expressed desire to invest in livestock, with Southern Province topping with 67.3% of the households reporting. Luapula Province recorded the lowest percentage (22.6%) of households desiring to invest in livestock...The highest percentages of households wishing to invest in additional land were recorded in Luapula (22.0%), Northern (15.4%), and Lusaka (12.2%) provinces.” (5% in Southern Province, lowest of any except Western Province.) (Zambia, 2000: 42)

So Southern Province did not differ substantially from national preferences, only showing even stronger interest in livestock and farm implements. Despite the low percentage of interest in additional land, its citation by 5% of Southern Province respondents still made additional land the third most preferred investment in the provincial sample, behind only livestock and farm implements (neither of which, one notes, are fixed investments).

For investments on a community basis, the most popular choices nation-wide were marketing centres (cited by 31%), followed by ‘other’ (17%) and feeder roads (14%). But in this case Southern Province differed from national preferences: marketing centres were preferred by only 14%, and the top choice was dip-tanks for cattle (28%), followed by ‘other’ (21%) and small dams (17%). (Zambia, 2000: 44) This seems to suggest again the importance of cattle in Southern Province: cattle dipping is used to protect livestock from the tick-borne corridor disease which has devastated herds in recent years,³⁸ and small dams can provide year-round

³⁸ “Cattle...are susceptible to a wide range of ailments...However, the most serious cause of recent mortality is widely recognised to have been corridor disease (locally known as “denkete”) which is a

water for livestock. Conversely, Southern Province can be said to already have a relative abundance of marketing centres along the line of rail.

Some further details are added by a 1994-95 'participatory' assessment by the World Bank and MAFF of smallholder farming and the effects of liberalisation thereon. Two districts were surveyed (including Monze District) in each of the three main agro-ecological zones of the country. Among their findings:

1. "Higher average cultivated areas were correlated with higher average household labor forces and the use of animal draft power." (Francis et al., 1997: 6)
2. "Although improved crop varieties were noted in all areas, most smallholder farmers have reverted to using retained seed or the traditional seeds due to reduced access to credit and seed supplies." (Francis et al., 1997: 6)
3. Fertiliser use was around 30%, but "At the same time, kraal manure was less available because of the decline in animal numbers as a result of drought and corridor disease in Southern Province." (Francis et al., 1997: 6)
4. "Some households hire in labor, which is generally remunerated in kind (by beer, clothes, or food), on a piecework basis. However, working for others means neglecting work on one's own fields at critical times, and tends to perpetuate a state of dependence. It is therefore usually only a short-term strategy for survival." (Francis et al., 1997: 8)
5. Major concerns of Southern Province (Plateau) farmers were drought, lack of inputs, lack of draft animals, army worm, and poor roads. (Francis et al., 1997: 13)
6. It is becoming increasingly difficult to obtain land for cultivation, especially for migrants (newcomers). "In other areas, farmers had migrated from land-poor areas such as Southern Province [*usually to Central Province*] expressly in order to gain title to land." (Francis et al., 1997: 14)
7. "In spite of the growing perception of land scarcity, titling was not considered by villagers as a solution to land shortage. Land titling was seen as something for the rich and politically well-connected, most expressing preference for the traditional system of land tenure..." (Francis et al., 1997: 14)

form of east coast fever...This is a tick borne disease, which commercial farmers are able to avoid (at a high cost) through weekly dipping of their cattle. Free dipping was provided in parts of the district by the Department of Veterinary and Tsetse Control Services (DVTCS) up until the 1970s, but was never fully effective and has recently broken down almost completely for lack of funds...Meanwhile, the best hope is that continued exposure to the disease should lead eventually to endemic stability within the cattle population, and that mortality can meanwhile at least be reduced through selective spraying against ticks, combined with other measures (such as controlled burning) to reduce tick populations..." (Copestake, 1997a: 40)

8. Farmers complain about excessively short-term and restrictive credit, unsuitable for replacing lost cattle. (Francis et al., 1997: 14)

To recap, a higher proportion of Southern Province households reported raising some cattle (33 per cent) than the country-wide proportion (13 per cent). The province is in the middle ranks for credit use. Desired investments at the individual and community levels were more oriented to cattle among Southern Province respondents than among respondents country-wide.

3.3.2 Customary Land Tenure

3.3.2.1 Zambia in general

There is a temptation to plumb the depths of archives of customary tenure practices, in the assumption that the oldest is the most authentic. But although retrospective information is always helpful to explaining the present, the search for authenticity risks creating the impression that customary law is essentially primordial. Berry (1993) and Woodhouse et al. (2001), among others, have amply demonstrated that customary tenure in Africa can be fluid, dynamic, and swiftly responsive to changes in technology, demographics, ecology, and politics (see Ch. 2, Section 2.8). Having said that, it seems likely that customary land law in Southern Province, like most law, rests as much on precedent as on immediate practicality; so a brief chronicling of its antecedents is needed.

Zambian customary land law, as in much of southern Africa (Adams, 2003: 10), generally involves chiefs allocating areas to sub-chiefs or headmen who in turn allocated parcels to their constituents, or verified the absence of other claims on parcels that constituents intended to cultivate:

“Each of the persons granted land in this way was secure in his rights and could not be expropriated without fault. He could transmit his rights to heirs, but could not transfer them to anyone else without the permission of his seniors. If rights were vacated they rested in the next senior in the hierarchy.” (Allan, 1965: 361)

While Tonga land law shares some of the common Zambian characteristics, it has differences stemming from matrilinearity and agro-ecology, among other factors. Moreover, law and practice have mutated swiftly in adaptation to changes in politics and agro-ecology over the past century.

3.3.2.2 *Tonga Land Law*

The literature distinguishes the Valley Tonga from the Plateau Tonga, the former inhabiting the portion of the Zambezi Valley called the Gwembe Valley (partially flooded by the Kariba Dam in the late 1950s), the latter inhabiting the Plateau that starts at the valley's rim and extends northwards to the Kafue River. Their land practices differed substantially, in parallel with the different agro-ecologies of the Valley and Plateau. The unflooded (pre-Kariba Dam) valley floor had broad riverine margins with alluvial soils where two annual croppings and horticulture were often possible around seasonal floods, plus less productive cropping farther from the river (Colson, 1963: 138). Valley Tonga therefore tended to inhabit and cultivate fixed riverside parcels, which were coveted and a source of authority for lineages that controlled their allocation. The permanent flooding of the valley by Kariba Dam forced many of the Valley Tonga uphill onto the rocky and arid feet of the plateau's escarpment, where cropping was close to futile. The Plateau, by contrast, features flatter land, better soils, lower temperatures, and more consistent rainfall. Also, the Plateau historically has been sparsely populated, allowing more room for shifting cultivation than in the valley's confines; indeed the fragile fertility of Plateau soils necessitated shifting (Colson, 1962). In the Valley, goat- and sheep-herding were possible but tsetse fly mostly prevented cattle-herding (Colson, 1963: 140-141). On the Plateau, cattle-herding was always a central feature of livelihoods, perhaps the most important feature until maize cash-cropping emerged in the 1940s (Colson, 1963). This section will henceforth focus on the Plateau Tonga who populate most of the study area, referring to them for convenience simply as 'Tonga.'

The Plateau has three broad soil types: (1) 'Plateau' soils, generally poor and sandy, found in the southwest of the Plateau; (2) 'Upper Valley' soils, fertile reddish brown loams, found in the northeast starting between Choma and Monze; and (3) large 'Transitional' areas between the two types.³⁹ The northeast Plateau has more '*dambos*' (seasonally wet depressions). 'Plateau' soils required application of ash for fertility, so bushland was chosen for clearing and burning to make fields, which would become exhausted in two to four years. In 'Upper Valley' soils, margins of *dambos* were preferred for cultivation because they required less clearing; such fields lasted from eight to 20 years. (Vickery, 1976: 57)

The main pre-colonial crops on the Plateau were sorghum and finger millet, with some maize, all cultivated by hoe. Secondary crops included groundnuts, ground beans, sweet potatoes, beans, and pumpkins. Cattle were valued but limited (despite the absence of tsetse fly on the Plateau) because of Lozi and Ndebele raiding. (Vickery, 1976: 56-57)

³⁹ The soil terms 'Plateau' and 'Upper Valley' originate in a 1932 ecological survey and are not coterminous with the geographical terms Tonga Plateau and Gwembe Valley. (Vickery, 1976: 57)

Pre-colonial Tonga land law was conditioned by low soil fertility, sparse population, and acephalous political organisation. Low population density allowed shifting cultivation and grazing, though population growth and loss of land to colonists eventually increased pressure on land. “The Tonga system of land-holding has been permissive to the existence of a shifting population, and it in turn is based on the assumption that land is plentiful and can be had by clearing unoccupied bush...Only recently has the situation altered, and the Tonga are still reluctant to recognize the implications of present-day shortages, and the increased value of land which has been stumped and manured.” (Colson, 1962: 178-179) As with the *chitemene* system among the Bemba of Northern Province (Richards 1939, Moore and Vaughan 1994), individual use rights resulting from the labour of land clearance were uncontested, but the rapid exhausting of soil fertility made transfer or inheritance rights irrelevant.⁴⁰

Few rules were observed on settlement patterns. There was a virilocal tendency, but a Tonga tended to be “eclectic in his use of kinship ties, rather than bound to follow matrilineal or patrilineal links to the exclusion of other ties.” (Colson, 1962: 181) Ritual and sentimental attachments to given localities are also slight, as ancestral spirits were thought to wander with the people. (Colson, 1962: 179) So in general, “The Tonga themselves know no reason why a man should not live where he will...even young children could not be denied the right to move from relative to relative.” (Colson, 1962: 180) Villages were *sui generis*: “Their residents may be linked by kinship matrilocally, patrilocally or affinally or by vague and untraceable genealogical links and by mere acquaintanceship. Matrilineal kinship certainly operates in certain fields of Tonga life such as in inheritance or in funerals, but does not determine the pattern of residence or of land holding.” (White, 1963: 366-367)

Nor did fixed investments tie farmers to one spot. “Even today few people have any major investment in fixed capital equipment, such as burned-brick houses, wells, or fruit trees, which attach them to one spot. Most houses are of pole and mud or unburned brick construction and rarely last as long as ten years before they are past repair and must be abandoned...[in footnote] Formerly there was no capital investment in land; i.e. land was not stumped or manured and after a short period of cultivation it reverted to bush fallow.” (Colson, 1962: 179)

⁴⁰ The difference between Lozi land tenure rules and those of the Tonga illustrates the interaction between land law and agro-ecology. In the Lozi (also known as Barotse) area in Western province, cultivation historically focused on the Zambezi River flood plain, using homestead mounds, canals and gardens. These represent a major fixed investment of labour, so holdings were heritable and private (though the chief might request a parcel of land to accommodate a newcomer). Out-migration to evade the colonial hut tax led to the decline of maintenance of canals, and Lozi floodplain production has never recovered. Upland field production (maize, cassava) is more commercialised in recent years. (Bruce and Dörner, 1982: 32) Lozi land law is not so different from that of the Valley Tonga (Colson 1963), probably not accidentally given that both groups’ livelihoods centred on permanent riverine cultivation.

This nonchalance about specific parcels and communities was susceptible to changes in demographics, agro-ecology, technology, and the macro-economy, especially the coalescence of urban workforces around the mines. “If the plough made an expansion of maize production possible, the development of Northern Rhodesia’s mines made it inevitable.” (Vickery, 1976: 63) The plough, introduced by newly arrived European colonists, started replacing hand hoes among the Tonga around 1915-1920. This interacted with returning labour migrants (first from the South African mines, and by the late 1920s from Zambia’s Copperbelt) who had money to buy draft oxen and plough accompaniments like chains. Ploughs, of course, required fixed investment in the form of stumping (especially in the southwest Plateau with fewer treeless dambos) (Vickery, 1976: 61). Because much of the population was dispossessed by the designation of large swathes of the area as Crown land (before the 1947 Order in Council that re-designated much of it as Trust Land—see above, Section 3.2.2), “...the conjunction of less land and more ploughs, in the context of a rising human and animal population, led to the serious problem of overcrowding and erosion in the 1930s and beyond.” (Vickery, 1976: 63) Centralisation of agricultural marketing also crept in: European complaints about African competition in maize production led to the 1936 Maize Control Ordinance, which established a monopsonistic Maize Control Board⁴¹ that paid a better price to European farmers than to Africans. Yet that inferior price was still better than what Africans had been receiving from private traders, so the Board unintentionally reinforced incentives for African maize production (Vickery, 1976: 63-64).

Within ten years of Colson’s data collection in the 1940s, the nonchalance towards land inheritance and acquisition seemed to have changed. “Land is regularly inherited among the Tonga, and is a regular method of acquisition of land by individuals. Unresolved problems are making themselves felt here, since the Tonga are matrilineal, but in modern practice, a Tonga farmers often farms with the help of sons, and would like them to inherit his land.” Father-to-son wills were creeping in, and matrilines compromised with this tendency by partially apportioning property to sons (White, 1963: 368).

The intervening years between Colson’s and White’s research may have been critical. Indeed they saw the expansion of land available to Africans through the establishment of Trust Land, the start of government programmes to support ‘progressive’ African farmers, and continued expansion of the Copperbelt’s urban population:

“The Tonga in various ways provide a sharp contrast to the Bemba; land has acquired a positive economic value both because of scarcity and because of cash cropping. Social consequences of the cash economy are appearing, with an increasing emphasis

⁴¹ Again, a colonial antecedent to what might appear to be a socialist-inspired post-Independence policy.

upon the bilateral nuclear family at the expense of the unilateral matrilineal group. The extent to which land is regarded as a valuable asset is illustrated by an increasing demand for the introduction of some form of land registration with individual documentary title in this area.” (White, 1963: 368-369)

So early demand for titles on customary land was motivated by increasing scarcity value and desire to ensure bequeathment against matrilineal repossession.

Inheritance procedures centred on the customary institution of estate administrators, the person or persons (usually matrikin member) designated to apportion the estate according to customary proportions and to maintain it until the beneficiaries take possession. “Under Tonga law, once an heir⁴² has been appointed, unless he is only succeeding to the deceased’s status (*kulyaizina*, which entails marrying the widow or widows), he inherits the entire estate which he is obliged to distribute to those entitled.” The obligatory distribution includes one share to the father of the deceased, one to the children of the deceased, and “the remainder and larger share to be retained by the heir to be distributed in part to the ‘*basimukowa*’ – members of the matrikin.” (Mvunga, 1982: 53-54) “Those from whom the matrikin may select an heir are, in very general order of preference, mother’s brothers, maternal nephews, maternal grandchildren and sons. But the matrikin will commonly disregard this order of preference to give the holding to a good farmer, openhanded with his relatives and generally mindful of his social obligations.” (Bruce and Dorner, 1982: 35-36) Local courts ratify the customary procedures and decide disputes.

However, matrilineal inheritance has been attenuated. Cases have occurred where the father or children of the deceased won appointment as administrator, albeit with the support of the *mukowa*, or had right of veto over it (Mvunga, 1982: 57-58). Wills of land are attempted, though “they appear to contravene customary law and their enforceability is not yet established.” (Bruce and Dorner, 1982: 35-36) Fathers increasingly use *inter vivos* transfers to children to avoid administration and strengthen their offspring’s eventual claim.

Widows may retain rights to gardens, and their previous gifts of land to children or other relatives may be respected in the reshuffle (Bruce and Dorner, 1982: 35-36). “In all the three areas [*Tonga, Luvale, and Ngoni*]..., although the widow has no entitlement in the deceased husband’s personal estate, her right to land is recognised and enforceable. A widow is entitled to retain the crop fields and the house she occupied during the lifetime of her husband. The only condition attached to this is that she should continue to reside in the husband’s village.

⁴² Mvunga uses the term ‘heir’ instead of ‘administrator;’ however we will follow the parlance of later law (Zambia Intestate Succession Act, 1989) which is clearer because the person administers without necessarily inheriting.

She need not have children...If the widow remarries outside the deceased husband's family, she forfeits her preferential rights in land left by the husband.” (Mvunga, 1982: 54) Women are generally barred from becoming heirs/administrators, through there have been court decisions in Southern Province to the contrary (Mvunga, 1982: 58). More recently, Machina (2002) has described the systematic circumscription in practice of women’s access to both customary and State land.

Access to customary land is still negotiated, not always successfully, which causes out-migration to provinces with more land. “In the Monze study communities and in the frontier areas north and east of Lusaka, lack of enough fertile land was an important reason for many departures from home villages. Matrilineal clan leaders, village elders, and individuals negotiate who gets how much, and which land. Migration decisions based on this sense of economic opportunity reflect the complex social environment of the village.” (Cliggett, 2000: 131) Social tensions and quarrels, including accusations of witchcraft, contributed to departures. But straightforward pressure on land plays the major part and indeed prompts such tensions: inheritance disputes often arise from large family sizes with insufficient land for distribution, or from commercial ambitions requiring larger maize fields and grazing areas (Cliggett, 2000: 132).

3.3.2.3 *Conclusion on customary tenure in Southern Province*

In the earlier situation in Southern Province, land inheritance was irrelevant because of lack of fixed investment and fragile soil fertility, so the matrikin was only interested in other property (like cattle). Later, ploughs necessitated stumping; chemical fertilisers prolonged fertility; and colonial dispossession plus population growth provoked land shortages, bringing new value to land and attracting the matrikin’s attention. The period of matrilineal land inheritance may prove to be ephemeral, as farmers seem to prefer direct bequeathment to children and have pioneered extra-customary methods (*inter vivos* transfer, wills, and flirting with statutory registration) to do so. The customary system is still largely self-regulating, though local courts ratify succession and decide disputes. Land pressure continues to increase, as evidenced by out-migration to other provinces.

3.3.3 **Settlement Schemes**

A central plank of this thesis’ method is to compare farmers under contrasting tenure regimes (see Ch. 4). Zambia’s dualistic land framework (see Section 3.2) suggests a comparison between farmers on state land and those on customary land. Most farmers on state land (aside from large commercial farms) are on settlement schemes, which have a distinctive context of

land tenure and farming methods. These should be explored to understand the implications of comparing settlement farmers with their customary-land counterparts.

3.3.3.1 Settlement Schemes and National Policy

Zambia's settlement schemes arose not so much to remedy excessive land concentration (though redressing dispossession was a secondary motive) as to take advantage of a surplus of good-quality land in the government's hands. Crown land was originally so designated because it was desirable for European settlement, containing good soils and transport links. Most State land therefore comprises strips along the line of rail, from Livingstone to Lusaka, and north through Kabwe to the Copperbelt. Naturally, then, this area would continue to play an important role in national agriculture. After Independence, some of Zambia's European commercial farmers departed, because of new policies that eroded commercial profits and expatriation thereof, and tempting land offers in white-ruled South Africa and (Southern) Rhodesia. "Approximately 1,185 European farms with a title area of 3.79 million acres existed in 1961. Approximately 460 European farmers left the country within two years after independence...By 1970-71, the commercial farming sector had declined to 1,076 farming units, of which 643 were classified as 'African' and 433 as 'non-African' (agricultural census). By 1981, the number of 'non-African' commercial farming units by most counts had fallen to around 300..." (Roth et al., 1995: 5) The story of settlement schemes is very much linked to this de-colonisation of prime land.

3.3.3.2 Objectives of Settlement Schemes

There were three main impetuses for the settlement schemes: first, to reduce crowding and unemployment in cities and provide livelihood assets for retiring or retrenched civil servants and industrial (especially mine) workers; second, to relieve pressure on customary lands; and third, to strengthen aggregate output in replacing or complementing European commercial farmers (and bringing idle State land under cultivation) with a newly-created class of indigenous commercial farmers on medium-sized parcels under statutory tenure.⁴³ The motives were therefore both economic and political: the first impetus aims at solving an urban socio-political problem; the second, a rural socio-economic problem; and the third relates to food security and aggregate production as well as de-colonisation (Mbulo, 1983: 1-2; Chenoweth et al., 1995: 177-179).

⁴³ In some additional cases, the motivation was to relocate people displaced by projects such as the Kariba Dam. A few, mainly remote settlements accommodated refugees from neighbouring countries (Angola, Mozambique, and Namibia).

President Kaunda was impressed by the early results of the settlements and supported their proliferation under a multitude of schemes: “From the late 1960s to mid-1980, a number of other alternative schemes were attempted including: peasant farmers schemes, master farmer schemes, family farm schemes, area development projects, the intensive development zones program..., consumer cooperatives, multipurpose cooperatives, tenancy schemes, settlement schemes, resettlement schemes, and crop season credit and minimum package schemes.” (Chenoweth et al., 1995: 185) The profusion of schemes and objectives was reflected in the assemblage of government agencies involved:

“The ZNS [*Zambia National Service*] ran 41 Rural Reconstruction Centers scattered throughout the country [*principally for unemployed youth*]. The MAFF [*Ministry of Agriculture, Food and Fisheries*] had a large number of settlement schemes under its control...the Ministry of Labour and Social Services was responsible for schemes for the handicapped; and Ministry of Local Government and Housing was involved in identifying settlement areas; the ZCCM ran two settlement schemes for people it retired; and the Department of Resettlement was established to run settlement schemes for other retired people. Cooperative schemes were run by the Department of Cooperatives, and the Ministry of Education schemes served as an outlet for the two agricultural colleges established in the 1960s. Schemes to encourage tobacco production were also run.” (Chenoweth et al., 1995: 180)

The government attempted to rationalise management of settlements by creating in 1989 the Department of Resettlement in the Office of the Prime Minister. In 1992 it was moved to the Office of the Vice President, but was still significantly under-resourced relative to the extent of its responsibilities (Chenoweth et al., 1995: 180-181).⁴⁴

After the heyday of settlements in the 1970s and 1980s, they now seem to suffer neglect, benign or otherwise. Perhaps they are seen by the current government as a relic of the socialist bent of their predecessors⁴⁵—an interpretation that seems to contravene the fact that at least some of these schemes explicitly aimed to create an upper class of medium-sized capitalist farmers (as *per* Mbulo, 1983: 15). At any rate, the quality of record-keeping and monitoring does not evince great official interest in the trajectory of the settlements. “Officials repeatedly acknowledged the availability of data, but despite many informal and formal requests, few data were ever provided due partly to information sanctions stemming from political sensitivities, poor data management, lack of records, and dearth of quality research by outside investigators.” (Chenoweth et al., 1995: 173) And, “Information on settlement schemes is so fragmented and out of date that it is difficult to discern even such basic facts as: which schemes actually settled people, the number of such schemes, the number of settlers, which schemes have been abandoned, when and why, which schemes were reorganized and had the

⁴⁴ The department still appeared to be struggling with insufficient resources at the time of the current study in 2001.

⁴⁵ Interview with Frank Lubasi, Reuben Mundiya (Land Use Officer), James Mwandwe (Senior Agricultural Officer), 7/6/2001, MAFF, Monze.

name changed, and which agency is currently responsible for running the schemes.” (Chenoweth et al., 1995: 185) Data were too incomplete to rigorously analyse the performance of settlement-scheme agriculture to date: “Nowhere in the data available to the researchers is there detailed information on types of agricultural activities, output, exact amounts of input or incomes of the settlers.” (Chenoweth et al., 1995: 194) This seems particularly noteworthy in view of the significant scale of the settlement sector: MAFF-run settlements alone totalled 375,861 ha as of 1995 (Chenoweth et al., 1995: 196-198), equivalent to 39 per cent of Zambia’s entire planted area of 942,362 ha (Cochrane and Roth, 1995: 203).⁴⁶

3.3.3.3 *Southern Province Settlement Schemes*

Southern Province “has the largest number of settlement schemes and is the country’s main producer of maize.” (Mupenda et al., 1983: 84) Of the province’s 8,528,300 ha, 98,275 ha (12 per cent) are under MAFF settlement schemes, and various other types (Rural Reconstruction Program, Cooperative Program, Southern Province Small Block Program, etc.) occupy a difficult-to-determine but apparently substantial additional area (Chenoweth et al., 1995: 195-197). Monze and Mazabuka districts had 35.8 per cent and 30.8 per cent of their land areas under settlement schemes as of 1993 (Roth et al., 1995: 9). These are the highest and third-highest percentages reported in the country.⁴⁷ (Table 3.1, below in Section 3.3.3.8, enumerates the agricultural settlement schemes in Monze and Mazabuka Districts and indicates those sampled in this study.)

The various settlement schemes had different management and trajectories. Most of the settlement schemes in Monze and Mazabuka districts were run by Family Farms Ltd., a guaranteed company incorporated in 1972 whose three main guarantors were the Government of Zambia, Barclays Bank (Zambia) Limited, and the United Church of Zambia.⁴⁸ Family Farms followed government policy but operated under its own Board of Directors (composed of one representative from each of the guarantors). It received land from the government under a 99-year lease (and in turn offered settlers 14-year sub-leases), as well as grants for operating costs and infrastructural development (Mbulo, 1983: 3). Family Farms handed over management of the settlements to the Department of Agriculture in 1985, following criticisms of its management aired to the Sakala Commission.

Exceptions to Family Farms management in Monze and Mazabuka districts were the ‘village’ settlement schemes of Ngwezi, Mwanachingwala, and Naluama. Ngwezi dates from 1963

⁴⁶ Entire planted hectareage is three-year average 1990-92. Note that settlement hectareage does not equal settlement planted area; some land is for grazing, some may be idle.

⁴⁷ Chipata district in Eastern Province is second, with 33.4 per cent.

⁴⁸ By 1994, Family Farms was describing itself as a non-profit NGO (Family Farms, 1994).

(pre-Independence) and was under the Department of Agriculture; the other two are under their respective area Chiefs jointly with the Department of Agriculture. In all three cases the aim was more to relieve land pressure in the chiefdoms⁴⁹ than to establish progressive farmers (Zambia, 1985: 112). Settlers in these schemes were given individual plots with communal grazing, without leases, and without ground rent owed to the government. Each family was required to bring 14 head of cattle into the scheme. No title deeds meant no covenants (conditions of occupancy), hence no leverage available to the government with which to regulate land use other than persuasion. “However, the majority of the peasants in the Province appears to favour this type of settlement more than other settlement schemes. The Commission was told by a number of witnesses that whenever land became available for use by peasants they would like to have established village settlement schemes under their Chiefs...Chiefs have a bigger say in settling people. In this way, they are able to exclude applicants from others Chiefs’ areas or districts.” (Zambia, 1985: 112) Ngwezi differs from Mwanachingwala and Naluama in having larger farm sizes (average 68 ha, vs. 34 ha) and having been managed by the Department of Agriculture without participation by or affiliation with any particular Chief.

3.3.3.4 *Selection of Settlers*

The principle was to select farmers who were most likely to use the land according to the government’s objectives. “There are four main factors considered in the selection process:

1. the applicant’s potential as a commercial farmer, as indicated by his past production record, his desire to change and innovate, and his use of resources;
2. credit-worthiness of applicant, determined by his assets and financial position;
3. the applicant’s available resources for farming – meaning number of cattle and other livestock, agricultural implements and size of family (to provide labour); and
4. the applicant’s need for a settlement farm (determined by his current available land).” (Mbulo, 1983: 4-5)

Selection committees consisted of the District Governor, District Agricultural Officer, Planning Officer, the Member of Parliament for the area, the Chiefs of the areas where settlers are to be drawn from, and the Settlement Initiator (e.g. Family Farms) (Mbulo, 1983: 3). For Mwanachingwala and Naluama (the village settlement schemes), the selection process differed: the relevant Chief and his Committee made the selections, and the Chief remained chairman of the settlement (Mupenda et al., 1983: 95-96).

⁴⁹ Particularly severe in Mwanachingwala because of seasonal flooding in the flats along the Kafue River. Chief Naluama’s area is also subject to land pressure, being mostly in the rocky Munali Hills or the waterlogged Nega Nega area west of the hills.

There were other exceptions to the selection processes: “This pattern of selecting substantially from rich sections of the peasantry is flouted only in cases where squatters have proved hard to move after having originally settled on abandoned farms and state ranches before the settlements are established: Tundwe especially is one such Settlement, where the selection mechanism had to be relaxed so as to allow some of the present squatters to be officially settled there.” (Mbulo, 1983: 5) (Tundwe’s disputes continued through the time of this study: see Ch. 5, Section 5.1.2.2.)

Selections sometimes had to be modified to take local feelings into account. The Sakala Commission heard that Kayuni West Settlement (Monze district) came under criticism because it was parcelled out not to people from the surrounding land-hungry villages but to people from around the district, apportioned to each chiefdom. This was subsequently corrected by giving four settlement plots to people from surrounding villages. A similar problem was later forestalled, bearing the Kayuni experience in mind, for Muyobe Settlement in Chief Choongo's area (Monze district) by allocating fourteen of the twenty plots to people from Chief Choongo’s area (Zambia, 1985: 42).

3.3.3.5 *Terms of Settlement*

Selected farmers were promised significant advantages on their settlements. “The incentive package...included: soil survey and demarcation of farm plots; access roads to each farm on the scheme; access to communal water supplies and cattle-dipping facilities; access to agricultural extension, credit, supply, and marketing services; sufficient cleared land for the first year of farming proposed; subsidies for fencing and water supply at the existing levels; tractor services for plowing; and transportation to the settlement area.” (Chenoweth et al., 1995: 182) The degree to which the planned extension services were maintained is not specifically documented, though general comments suggest disappointment (Zambia, 1985: 114-115.) Different incentive packages (less focused on commercial farming) were offered for settlements catering to the unemployed, retirees, and subsistence farmers (‘village’ settlements).

3.3.3.6 *Land Tenure on the Settlements*

Though the settlements thus enjoyed some farming advantages, secure tenure did not always rank among them. “Schemes have had a less than remarkable experience with acquiring 14-year titles [*sic*] to land.” (Chenoweth et al., 1995: 192) Applications even for the short leases were lost or delayed; there were unresolved questions about inheritance, subdivisions, and transfers; and upgrading to the 99-year lease could prove excruciating.

Settlers on the Family Farms-managed schemes did not hold legally recognised leases. Family Farms held the ‘head lease’ (99 years) for a whole scheme’s area, and (on some settlements, in Choma and Magoye) issued occupancy agreements to settler tenants. These agreements (quasi-formal one-page documents) stated a duration of 14 years, renewable, apparently imitating official leases from the Ministry of Lands. However these agreements were of “debatable...legality”, and Family Farms’ attempts to have them converted into official sub-leases by the Department of Lands apparently went unanswered (Chiputa, 1985: 3). On other Family Farms-managed settlements, not even occupancy agreements were issued, so: “As far as the farmers are concerned they are at the mercy of the management... [s]ince they have no legal document which protects them apart from verbal assurances from the company which state that if someone is utilising his farm he has no reason to worry about eviction.” (Chiputa, 1985: 3) Tenure security was much on the minds of settlers, according to Family Farms: “For many years now, tenants have been crying for security by way of leases or Title deeds as the case may be. Actually this has become a serious problem which has brought a lot of mistrust and rumour mongering between the farmers and the company management. The opponents of the company have taken advantage of this situation to propagate false stories.” (Chiputa, 1985: 3) For its part, the Sakala Commission heard complaints about the rents charged by Family Farms, and noted that whoever’s fault the non-issuance of proper leases had been, “The disadvantage of this policy from the point of view of the tenant is that he remains a tenant for life.” (Zambia, 1985: 114)

Inheritance or succession in lieu of officially recognised land documents was a related problem. Inheritance was not automatic:

“The understanding and practice is that if the tenant dies, the farm reverts to the company for re-allocation. Members of the family of the deceased may apply for re-consideration with any other applicants. The only exception to this is if the tenant had completed a Common Tenancy agreement form with another member of the family in which case tenancy would continue of course with all other conditions met...A lot of argument has been raised here. It is argued that the element of a ‘family farm’ is defeated if the company just recognises the registered tenant *[without recognising the other family members as well]*.” (Chiputa, 1985: 3)

This corresponds with reports that some settlement parcels were acquired and developed by extended families as group investments: one household of the extended family settled there to look after the parcel and everyone’s livestock, but then disputes arise when the head-of-household tries to bequeath the whole parcel to his/her offspring.⁵⁰ (Extended-family farms may not have been what Family Farms had in mind.) The stakes were apparently high enough to divide families against each other: “The response to a Common Tenancy is not very

⁵⁰ Interview with Charles Dinda (Co-ordinator, Law & Development Association [LADA]), 20/8/2001, Monze.

encouraging. Tenants fear to be killed in one way or another by their partners since the agreement has to be signed by both, such that the new partner is certain of taking over the farm if the other one dies, and the sooner this comes to be probably the better for the one taking over.” (Chiputa, 1985: 3)

One way or another, with Family Farms sub-leases, offspring’s inheritance was not automatic, indeed was unlikely. By contrast, on other settlements, leases (not sub-leases) directly from the government seem to have been heritable. Defaulting on annual land tax could endanger renewal, but in practice non-renewal and dispossession almost never happened; there were generous grace periods. (Widows however tend to have difficulty pursuing leases if their late husbands had not already obtained one.)⁵¹

3.3.3.7 *Results of Settlement Schemes*

By the early 1980s, settlements were already disappointing expectations. Yields were greater than on customary lands, but still below target for the major crops (maize, cotton, groundnuts and sunflower), given that “settlers are selected from that section of the peasantry which has more farm machinery, more livestock, use more modern techniques of production, and use more modern inputs to enable it produce very much above the average peasant.” (Mbulo, 1983: 14)

What about the social goals of improving welfare for rural inhabitants? Settlers who had been initially better-off were accumulating; those who started with fewer assets were breaking even or failing. The results seemed paradoxical for an avowedly socialist (or African Humanist) government: “Humanism had been rendered to Zambians as an ideology against class formation and development, yet the history of family farms had been one of promotion of a rich group of the peasantry.” (Chipungu, 1988: 162) “Perhaps the Government’s real aim in setting up the scheme is not that of generally raising living standards by raising output of the peasantry, but rather that of concentrating efforts and resources on a tiny group of an already advancing section of the peasantry in the hope of raising output: the aim, thus, is that of establishing small capitalist farmers in the hope that these would increase agricultural output.” (Mbulo, 1983:15)

Though the initial strategy may thus have been to bet on the strong, by 2001 (according to one settlement agricultural officer) settlement farmers had been set far back by drought, corridor disease, and lack of credit. Some have title deeds but do not know how to leverage them; there

⁵¹Interview with Aaron Mwemba, former Monze District Agricultural Officer, 14/4/2001, Magoye South Settlement (Monze District).

is little cash-cropping; the government is paying equal attention to customary and settlement farmers; and some settlers have turned their farms into ‘villages,’ bringing extended family onto the land.⁵²

The problems of customary land pressure and urban overcrowding and retrenchment still exist, indeed may be worsening, so settlement still seems a relevant remedy. “What can be concluded is that a huge amount of resources has gone into these endeavors, and settlement programs are still held in favor by many policymakers in Zambia today as a way of providing land for farming and other social services to the disadvantaged population, urban people, and retiring or terminated civil servants.” (Chenoweth *et al.*, 1995: 196) Nonetheless, by 2001 no government policy to revive existing settlements was evident.⁵³

3.3.3.8 *Settlements surveyed for this study*

Table 3.1 summarises the settlements in Monze and Mazabuka Districts (those surveyed in this study are indicated in **bold**). Most of the surveyed settlements were initially managed by Family Farms Ltd., which handed over control to the District Departments of Agriculture in the mid-1980s. Exceptions are: (1) Kayuni East (founded in 1993) and Tundwe (1975), which were under the Departments of Agriculture from their beginning; (2) Namilongwe, started as a Rural Reconstruction Centre (RRC) in 1975 and converted to a settlement in 1992⁵⁴; and (3) Mwanachingwala, established under the Department of Agriculture and Chief Mwanachingwala as a ‘village’ settlement scheme.

3.3.4 Land Problems in Southern Province

The effects of tenure insecurity cannot be studied unless it and its opposite co-exist in proximity. Furthermore (as discussed in Ch. 2, Section 2.9.2), different land rights may have differential effects; for example, access to credit can be constrained by non-mortgageability, though that strictly speaking is not tenure insecurity. Speaking then more broadly than ‘tenure insecurity,’ what land problems exist in Southern Province, and what is their putative effect on farming performance?

⁵² Interview with Frederick Choobwe, Silwiili Settlement Agricultural Officer, 13/7/2001, Silwiili Settlement (Monze District).

⁵³ Interview with Sylvester Kalonge (Agricultural Officer, USAID), 21/9/2001, Lusaka.

⁵⁴ “In 1975, the government commenced with the establishment of these centers as settlement schemes with the objective of fitting school-leavers and urban unemployed youth for productive life in the rural sector.” (Chenoweth *et al.*, 1995: 185) In 1989, the government announced that RRCs would be henceforth used for permanent resettlement, with the proviso that “settlers who were already in place *[from the RRC period]* would be given title deeds prior to admitting newcomers.” (Chenoweth *et al.*, 1995: 183)

Table 3.1: Settlement Schemes in Monze and Mazabuka Districts

SETTLEMENT NAME	Managed by	Date established	Total Area (ha)	Av. Farm Size (ha)	No. of Farms
Mazabuka District:					
Dumba	Co-operative			-	41
Lubombo	Co-operative			-	73
Magoye A	Family Farms	1976	400	40	10
Magoye B (Dumba B)	Family Farms	1976	2000	77	26
Magoye D	Family Farms	1977	835	84	10
Magoye E	Family Farms	1979	805	62	13
Mbaya	Family Farms	1971	3815	83	46
Musuma	Family Farms	1971	1935	59	33
Mwanachingwala	Chief /Dept Ag	1973	6141	34	180
Naluama	Chief /Dept Ag	1978	7750	34	226
Nega Nega A	Family Farms	1975	1175	90	13
Nega Nega B	Family Farms	1979	2870	18	159
Nega Nega C	Family Farms	1977	764	96	8
Nega Nega Kabesha				-	47
Ngwezi	Lands / Dept Ag	1963	8793	68	130
Ngwezi A				-	37
Ngwezi B				-	14
Ngwezi C	Family Farms	1973	1305	73	18
Tundwe	Dept Ag	<1975	1200	29	41
Upper Kaleya	Family Farms	1974	4875	98	50
Monze District:					
Hufwamalende		1989	5780	148	39
Kaumunzya		>1980<90	1200	75	16
Kayuni E		1992	2180	42	52
Kayuni West	Family Farms	1980	3220	85	38
Kazungula A	Family Farms	1973	3654	135	27
Kazungula B	Family Farms	1975	755	69	11
Magoye C	Family Farms	1976	1454	104	14
Magoye South		1990	2000	74	27
Mujika		1946		?	
Muyobe	Family Farms	<1985	1400	70	20
Muzuri	self-managed	1997	3000	?	
Namilongwe		1975	2000	22	89
Roberts	self-managed	1997		-	40
Silwiili	Family Farms	1976	8797	183	48
Totals*			80,103	50.19	1,596

SOURCES: Mupenda et al. 1983; hand-written reports available at Monze and Mazabuka District Departments of Agriculture

*omitting those for which no information on hectareage or number of farms is available.

bold = surveyed in current study

3.3.4.1 Problems with Customary Tenure and Inaccessibility of State Land

The 1981-82 Commission of Inquiry into Land Matters in the Southern Province (Zambia, 1985) (called the “Sakala Commission” after its chairman) investigated complaints about

growing land pressure in the province's Reserve and Trust lands. It heard criticisms of customary tenure:

“...many witnesses who appeared before the Commission bemoaned the lack of title deeds in the Reserves and Trust Land areas. A majority of these witnesses told the Commission that customary land tenure prevents a landholder from using his land as security to secure credit from financial institutions. The Commission was further told that the customary land tenure systems inhibits development in a number of ways. They said that although a man may be allowed the use of a piece of land the local community would be alarmed if that individual fenced up his portion.” (Zambia, 1985) (117-8)

Witnesses also bemoaned the extent and inaccessibility of State land in the province. The struggle for independence as they saw it was a struggle to regain land, so there was deep resentment at recent continued expansion of commercial farms and government acquisition of absentee farms and conversion into State farms. “They further informed the Commission that the new commercial farmers who are basically Zambian have proved to be more indifferent to the sufferings of their fellow Zambians than did the European Commercial Farmers.” (Zambia, 1985: 37) Witnesses from Reserve/Trust lands in Choma District similarly said that white commercial farmers used to allow them to graze their cattle but now Zambian commercial farmers do not. (Zambia, 1985: 72)

3.3.4.2 *Insecurity and Farming Pre-Conditions*

The effects of tenure security and other land rights on farming practices may only be activated when other pre-conditions for farming are met: “Those whose experience concerns areas where the many other preconditions for commercialization such as credit, new inputs and markets are not available, quite rightly deny that insecurity generated by land tenure is a constraint. Others, including some farmers interviewed in Eastern, Central and Southern Provinces, where those preconditions are being met, assert that it is indeed a constraint.” (Bruce and Dorner, 1982: 29) Perceived insecurity can also be prompted by the appearance of statutory tenure as an alternative: “It [*leasehold*] is an alternative which appears to offer an escape from tenure which is enmeshed in a complex of customary and personalized relationships with traditional authority, relatives and neighbors, into tenure based on a relatively impersonal and businesslike relationship with the Government. The very awareness of the possibility of leasehold tenure thus contributes to the consciousness of insecurity under traditional tenure rules.” (Bruce and Dorner, 1982: 33)

3.3.4.3 *Bequeathment and Farm Development*

Lack of freedom of testacy (bequeathment) may not matter much in land-abundant agriculture where one parcel has the same value and fertility as the next. “But when major investments are made in land, a landholder tends to develop much stronger preferences as to who should

take over the farm after his death. From the remarks of commercial and emergent farmers this would appear to be the trend in those areas of Zambia being affected by commercialization of agriculture. A trend toward father-son inheritance has been noted in the literature, and the authors' inquiries confirmed this." (Bruce and Dorner, 1982: 37) The uncertainties of matrilineal succession may affect farm development: "It is arguable that such uncertainty is deleterious to the long-term development of farms. A good farm is the work of 20 to 30 years, a generation, particularly for emergent farmers without much capital. What this farmer invests in his land is labor and such limited capital as his labor produces. That labor is largely the labor of his nuclear family...The development of the family farm is furthered if his children's labor remains available as both they and the farmer grow older. But will they do this, if there is uncertainty as to the heir? The uncertainty would appear to reduce the likelihood of trans-generational, stable development of farms." (Bruce and Dorner, 1982: 38) Insecurity of bequeathment, in this view, therefore hinders farm development, whether the insecurity stems from matrilineal succession or settlement scheme management.

3.3.4.4 *Social Sanctions Against Accumulation*

Platteau (2000: 59; see Ch. 2, Section 2.5) raises the possibility that investment demand is stifled by fear of envy. Kindness (1996), using anthropological methods, finds evidence in Monze District for what is arguably a manifestation of envy: perceived links between wealth and witchcraft. "It is sometimes said that nobody can become rich without witchcraft." (Kindness, 1996: 69) Informants reported a multitude of witchcraft methods for accumulating or reproducing wealth, differing according to the productive activity (maize growing, cattle rearing, or business and trade). To take maize as an example, such methods are reported to take the forms of: 'labour theft' (making a person work unwittingly in another's fields while asleep); killing children to improve the harvest (either using them for ghost labour, or improving the harvest through blood sacrifice); passing through another's field with medicine to destroy their harvest out of jealousy; having ghosts steal maize from others' granaries; incest (though informants disagree on this; incest might be more suitable for business); and kidnapping in a way that transforms the child's growth into the growth of wealth (accumulation). "...[G]rowing maize is hard work, and much witchcraft revolves around stealing labour from people." (Kindness, 1996: 191) People who have good harvests from small fields are suspect.

"The association of different forms of wealth with distinct racial groups is also stressed." (Kindness, 1996: 222) White people's involvement with witchcraft is seen as mainly limited to cash money and banks, both perceived as white institutions. Asians, strongly associated with shopkeeping and trade in Monze, are not thought to use witchcraft to kill, but rather more

tangible means (such as getting Africans to do it for them), then using body parts for witchcraft. “Lots of people in business do not kill other people. But their businesses do not do well. They just come up and disappear. But those businesses that actually last require the killing of people. There are a lot of businesses in Monze, and where the money comes from is a mystery (Extract from field notes).” (Kindness, 1996: 200) For the Tonga themselves, “Real wealth, which can be used to pay bride-wealth, is '*Lubono*.' This could be cattle and latterly money. Food is not *lubono*.” (Kindness, 1996: 69, footnote) While it is difficult to derive from this information an assessment of whether such reported attitudes affect economic and distributional outcomes, it does at least raise the possibility that a major constraint on accumulation (including land, fixed investments, or any productivity-boosting capital) is jealousy and social sanction in the form of witchcraft accusations, and fear thereof.

3.3.4.5 *Conclusion on Land Problems in Southern Province*

Inter-generational tenure security may be important for the long-term project of farm development. Safeguarding subsistence mitigates against land's use as collateral, and besides there is little logic in risking land for short-term credit in a capricious farming environment. However statutory tenure may facilitate access to credit apart from direct use of land as collateral, by signalling ability to a lender. Statutory tenure may also offer more certainty of bequeathment as well as a more straightforward relationship ('impersonal and businesslike') with the land-governing polity, perhaps avoiding jealousy problems that can discourage investment and accumulation. The 'businesslike' relationship, however, has not afforded easily accessible land titles for Southern Province's settlement farmers, calling their security into question. Do empirical studies in Zambia to date address these deduced possibilities?

3.4 Previous Zambia Land and Agriculture Studies

There have been numerous studies of Zambian farming over the years, but relatively few empirical studies on the effects of land tenure on farming performance. The studies cited in previous sections (Colson 1962, White 1963, Vickery 1976, Bruce 1982, and Mvunga 1982) used mainly qualitative and archive data, and inference.

3.4.1 Settlement Farming Methods: Mbulo (1983)

Mbulo (1983) used data from 11 settlement schemes in Monze and Mazabuka Districts (including seven sampled in our study) and focused on the settlement farmers' attempts to use more 'advanced' and larger-scale farming methods than customary-land farmers from whose ranks they were drawn. In what ways were they to be more 'advanced' than small-scale farmers on customary lands to whom, after all, advanced inputs (hybrid seed and chemical

fertiliser) were accessible on easy terms (Section 3.1.1)? Mbulo reports no use of large-scale irrigation (which would have been a major advance in this drought-prone area) in the Southern Province settlements sampled in this study, nor of regular use of mechanical traction. Settlement farmers thus found themselves in situations of labour constraint as they tried to cultivate their (often large) allotted areas. Rainfed agriculture in this zone carries a short annual window of opportunity for planting at the onset of rains, if maximum yield is to be achieved. Moreover, ploughing in advance of this window is problematic because of the hardness of dry soil (making animal traction difficult) and because it encourages weed growth. Thus labour shortages arose because of the need for timely planting: “Labour shortages therefore are a result not only of the fact that agricultural work is concentrated in one season, but more important, that within this growing season there are competing simultaneous demands for attention by different crops in planting, weeding, harvesting, etc. The timely response by peasants to these simultaneous demands greatly determine labour productivity, and thus output.” (Mbulo, 1983: 5-6)

Mechanical traction, the obvious remedy, also turned out to be of limited help: 20 or so hectares of cultivation did not financially justify tractor purchase. “Family Farms has actively hindered its settlers from acquiring loans for tractors. The assumption is that settlers have adequate labour to support the labour-intensive ox-drawn implements that they use in farming.” (Mbulo, 1983: 8) Neither did tractor sharing or rental solve the problem, because the planting window is so short that peak demand exceeded tractor supply; and early ploughing caused problems of heavy weed growth. It seemed that the sort of medium-scale farming that the settlement policy envisaged was bumping against certain physical limits, or at least falling into a gap between animal and mechanical traction: “The evidence so far is that settlers cannot plough and plant up to 20 hectares using their ox-drawn implements within the two weeks that, say, maximum returns can be obtained for maize.” (Mbulo, 1983: 7)

So getting enough labour on the job at the critical time was pivotal. “There are settlers who occasionally hire labour, especially in stumping and harvesting, but this is not yet an important source of labour. Family labour is still by far the most important, such that the incidence of polygamy is quite high in the settlements. Relatives [*coming at the time of peak labour demand*] constitute the second important source of labour...While average family sizes vary between settlements from 15 to 20, average working residents vary from 6 to 10.” (Mbulo, 1983: 6)⁵⁵ Gendered division of labour was eroded somewhat on the settlements: because of

⁵⁵ Our data from 2001 show that mean household labour force (defined as all residents between the ages of 12 and 64) on the State land households in the sample was 7.56 persons; median was 5. If only lease-holders and title-holders’ households are counted, mean household labour force is 9.32 and median is 7.22, squarely within the range that Mbulo found in 1981.

seasonal labour bottlenecks, men and women did much the same physical tasks out of necessity. “It is the financial and managerial aspects of farming that are still the exclusive domain of men.” (Mbulo, 1983:6)

Regarding livestock husbandry, most settlement parcels included individual grazing areas. One exception was Mwanachingwala, which had communal grazing areas, due to its design as a ‘village settlement’ scheme instead of a production-oriented one. Mbulo notes over-grazing in some settlements, apparently because settlers invited relatives with cattle to share their parcels (Mbulo, 1983: 10).

Settlers were constrained to follow certain basic conservation measures,⁵⁶ but few were observed to do more than the minimum of crop rotation, ploughing across slopes and not burning grass (Mbulo, 1983: 10). A Family Farms report from 1994 recalled coercive colonial-era programmes promoting soil conservation, which indigenous farmers feared as a precursor to further expropriation in favour of European settlers. When the Family Farms Conservation Department started encouraging soil and water conservation in the early 1980s, “...farmers were still reluctant to accept the proposed structures probably due to the excessive labour involved and the uncertain land ownership situation in some part of the project area. It should also be noted that the plateau area is generally quite flat and erosion induced by water is not very visible but existing.” (Fischer, 1994: 4) Such reluctance might also be explained by that fact that in an era when fertiliser was available on easy terms to small and medium farmers alike, labour-intensive conservation methods of preserving soil fertility were bound to be less popular.

Credit was supposed to be a key component of settlement farming, but at the time of Mbulo’s study it was mostly short-term and seasonal. Main providers were state-owned banks: “Medium and long term loans are very few and only provided by the AFC [*state-owned Agricultural Financing Corporation*]. Initially Family Farms issued medium term loans to settlers for land development (fencing, bore-holes, wells, sundry items, etc.), but this was discontinued in 1974 after many settlers failed to pay back the loans in the short time they were supposed to.” (Mbulo, 1983: 12) Banks required a cash deposit of one third of the loan’s value; an additional security was the fact that they could get repayment through a stop-order on the farmer’s ‘maize cheque’ from the Co-operative Marketing Union or National Agricultural Marketing Board (monopsony maize buyers) (Mbulo, 1983: 12). When droughts occurred, borrowers had to sell livestock to meet loan payments, so as to stay eligible for subsequent

⁵⁶ Specified in the *Zambian Land Use Planning Guide* (Republic of Zambia Department of Agriculture, Ministry of Land and Agriculture, Lusaka, 1977).

loans. “Under such conditions settlers are increasingly turning to growing cotton which tends to be more drought-resistant than maize, requires less fertilisers which are very expensive, and thus raises the possibility of earning cash to enable the farmer to pay back the seasonal term loan...” (Mbulo, 1983: 13) According to Mbulo, lending policies also tended to favour the already advantaged, maximising profits (or minimising risk) by selecting borrowers with the most assets, which amounted to betting on the strong and acted as “a fetter to the making of capitalist producers from the ranks of small producers.” (Mbulo, 1983: 15)

The experience of settlements therefore suggests that selecting ‘proficient’ farmers, allocating them relatively large parcels, and providing moderate extension services did not guarantee the establishment of mid-sized commercial farms. Credit was too short-term for settlers to make major investments like boreholes, and too focused on the already well-off. Soil conservation measures, especially labour-intensive ones, were unpopular. The areas to be cultivated per parcel, combined with the short planting window, seemed to be greater than that which could be achieved with family labour, yet less than that which would make mechanical traction (even shared) financially viable. Mbulo, while elucidating these issues, did not address whether the settlements’ land tenure system, at least, proved advantageous to settlers.

3.4.2 Land Tenure and Agricultural Development in Customary Areas: Eastern and Southern Province (Place et al. 1995)

The first rigorously quantitative study on land tenure and farm performance in Southern Province was conducted by a team from the University of Wisconsin’s Land Tenure Center⁵⁷ in 1993-94 (Place et al., 1995). The study was commissioned by USAID (United States Agency for International Development) to contribute to the contemporary debate about land reform under the new MMD government. Its methods and results deserve careful attention. The study focused on customary areas in Eastern and Southern Provinces, the former because of an ICRAF research station there, and the latter “mainly because of tree planting initiatives there.” (Place et al., 1995: 150) “Selection of research sites within provinces was decided on the basis of traditional descent patterns affecting land transfers [*in order to test the effects of matrilineal inheritance*] and the presence of tree planting activities...The researchers purposefully selected villages and settlements in the district [*Mazabuka District, in Southern Province*] with the intention of capturing a significant percentage of tree planters among the sample of households.” (Place et al., 1995: 150-151) Within selected areas, household sampling was mostly random. 28% of the Southern province sample was “larger farms on

⁵⁷ In conjunction with the University of Zambia and the International Centre for Research in Agroforestry (ICRAF).

State Land” (Place et al., 1995: 151), apparently meaning settlement scheme farms. The sample comprised 100 households in Southern and 98 households in Eastern Province.

The bulk of the study describes perceived or claimed land rights, as a proxy for tenure security. Such rights were enumerated, then grouped as use rights (e.g. cultivate annual crops, erect fencing), transfer rights (e.g. give land to family members, sell land outside the family), and exclusion rights (e.g. prevent others from cropping, from grazing, from woodcutting). Conceding that “Tenure security is a difficult concept to measure precisely” (Place et al., 1995: 159), the authors characterise use rights in the study area as having good breadth, duration and assurance. “Informal interviews corroborated this finding: respondents mentioned that land would only be taken away in the case of 'unseemly' behaviour on their part.” (Place et al., 1995: 159) The claimed duration of rights had exceptions, e.g. the absence of perceived right to long fallow, and women's perceived risk of land loss to male relatives.

Title seemed to make no difference to access to credit. Perception of increased security through titling was roughly 36% in both provinces; however, in Southern Province, the perception that title increased security was more widespread among respondents on state land than on reserve land (Place et al., 1995: 160).

One-fifth of the sampled households had been in a land dispute sometime the past. In Eastern Province, “11 households are currently involved in a dispute and seven actually lost land as a result of a dispute.” (Place et al., 1995: 161) In Southern Province 3 per cent were currently involved in a dispute and 7 per cent had lost land.

The study went on to test land tenure's effect on agricultural development indicators, albeit as a secondary aim: “The LTC/ICRAF study did not have as an objective the analysis of links between tenure and agricultural productivity or development. Therefore, the indicators used in this analysis are probably not sufficiently rigorous in measurement or breadth to warrant any definitive conclusions. Further work will certainly need to be undertaken.” (Place et al., 1995: 162) Agricultural development indicators were grouped as: credit and oxen use; land improvements; and tree products/tree planting. The study generally used two proxy variables for tenure security: perceived or claimed rights, and mode of acquisition. Regression analysis allowed the inclusion of control variables that may independently affect agricultural performance (farm size, head-of-household age and education, livestock, etc.).

Three hypotheses are tested: “(1) The incidence of agricultural development indicators is lower on matrilineal land than on land acquired by other means.⁵⁸ (2) The incidence of agricultural development indicators is higher where households claim to have land alienation rights. (3) The incidence of agricultural development indicators is higher where households claim to be the owners of the farmland.” (Place et al., 1995: 165-166) The authors cite statistical problems stemming from the problem of inter-related factors in farm decision making, and the difficulty in separating these out from a limited sample. The manifold combinations of dependent variables (agricultural indicators) made it necessary to group the indicators (e.g. credit use, any earthworks) into binary variables, with which logit regression could be used.

Results: Hypothesis one (lower agricultural development indicators on matrilineal land): some support was found for the hypothesis regarding some indicators in certain locations. However none of the non-matrilineal modes of acquisition (headman/chief, allocation from state, patrilineal inheritance) was clearly superior to the others in terms of stimulating the indicators.

Hypothesis 2 (land alienation rights): results were mixed. In Southern Province, there was some correlation between claimed transfer rights and organic inputs, but a negative relation in Eastern Province with tree planting (which may be due to tree-farming extension activities there). Overall there is no strong conclusion. (The reader notes that since land sales very rarely happen despite what rights the operators claim, this may be an illusory independent variable.)

Hypothesis 3: perception of ownership is positively linked to use of credit and some of the improvements, so the hypothesis is supported.⁵⁹ However, perception of ownership and agricultural indicators may both be influenced by household characteristics, so another regression was performed with perceived ownership as the dependent variable and several household characteristics as independent. “A strong relationship was found between household ownership and wealth indicators...raising the possibility that the wealth of a household may lead both to more individual claims of tenure control and to more investments.” (Place et al., 1995: 167)

Other results: In Eastern Province, farm size was strongly linked to, and was the most important explanatory variable of, several of the indicators. Surprisingly, education did not

⁵⁸ This recalls Bruce’s (1982) argument, cited above, that matrilineal inheritance contains disincentives for family farm development.

⁵⁹ Multivariate regression was necessary to prove this point, in view of Bruce’s observation that “It is difficult to establish possession of a leasehold as a critical variable in obtaining credit, because the leaseholder is invariably exceptional in several ways.” (Bruce and Dörner, 1982: 35)

increase likelihood of productive improvements. Size of household labour supply is positively related to earthworks (not surprising, since those are labour-intensive investments) and oxen. There was no clear influence of extension visits, distance to market etc. on development indicators.

In summary: Most land is acquired by non-market means. Long-term exclusive use rights are claimed by most. Transfer rights are far more limited (including state land, which by law could not be sold,⁶⁰ only the improvements thereon). There was wide variation in who is perceived to be the owner, with 60% of operators claiming to be the owner, many others attributing ownership to higher levels such as extended family and traditional authorities, and almost none agreeing with the law (1975 Conversion of Titles Act) that gives ownership to the state (Place et al., 1995: 170). More than half the sample had obtained formal credit, almost all without land as collateral. Agricultural development indicators were somewhat negatively related to matrilineal acquisition, little related to perceived land alienation rights, and positively related to perceived self-ownership (though wealth appears to be a strong explanatory variable for both). Farm size was the most important variable in determining development indicators in Eastern province.

The authors note the methodological limitations of this study, particularly: (1) narrow geographical area; (2) use of land rights as a proxy for tenure security (“which rights are most important for agricultural productivity in Zambia?” (Place et al., 1995: 170)); (3) productivity indicators, especially this study's use of binary variables, which with the case of near-universal inputs like fertiliser are inadequate; and (4) non-collection of data on crop output and livestock.

They recommend that the link between wealth and tenure security be further explored. “The relationship between tenure, grazing, livestock management, land use, land investment, and market access are crucial to understanding the effects of land policy interventions. These linkages all stood beyond the scope and intent of the present study and, in light of the lack of sufficiently rigorous analytical work in such themes elsewhere in Zambia, represent key issues for future research.” (Place et al., 1995: 171)

Groundbreaking though this study was in Zambia, some critiques can be offered, in addition to those anticipated by the authors:

⁶⁰ The study was before the 1995 Lands Act that permitted land sales.

1. It did not test the difference between State and customary tenure vis-à-vis either perception of ownership or the dependent agricultural performance variables; instead it was more interested in identifying gradations within customary land.
2. It generally treated fixed investment variables as binary (either present on a respondent's farm or not, irrespective of quantity), whereas some such as tree-planting would be better expressed as continuous variables. After all, the effort and cost involved in planting one tree is near zero, but fifty trees is significant; and in fact the mean number of trees planted among households that had any was 18 fruit and 58 multi-purpose trees, so there was wide non-zero variability.
3. The grouping of credit and oxen use, land improvements, and tree planting could be improved. Some of the variables designated as land improvements (like chemical inputs) are short-term not fixed investments. Grouping oxen use with credit is not totally convincing, as they are discrete phenomena with distinct aetiologies and motives.
4. The purposiveness of the selection of study areas (following tree-planting initiatives) presumably had logistical advantages, but is imperfectly related to the points that the study tried to test.

The study is to be commended, however, for using a series of farming performance indicators as the dependent variables (i.e. the outcome of interest), rather than mere productivity or yields. It takes no great imagination to see that in a mixed livestock-cropping agro-economy like Southern Province, putative benefits of tenure security like credit use and fixed investments may well contribute to cattle husbandry while leaving maize productivity unchanged. The search for the effects of tenure security must not be limited to staple crop yields.

3.4.3 Adjusting to Structural Adjustment and other Shocks (Bangwe 1997, Waller 1997)

Bangwe (1997) assessed “the impact on agricultural production, income and poverty, of liberalisation and desubsidisation of financial and other agro-services in the context of a series of adverse shocks (drought, cattle disease, HIV/AIDS and structural adjustment).”⁶¹ The study selected 35 households in Monze District (from a previously used sample frame) purposively to maximise variability. Information on the land tenure status of respondent households was limited, but:

⁶¹ This study is only available as an unpaginated HTML document; hence no page citations are given. Section numbers are given where possible.

“Land continues to be an emotive issue from the legacy of colonial land grabbing. Like other assets, land attracts multiple and joint claims by members of extended family. Most households claimed several parcels of land located in different locations. Nine percent of heads claimed access to land was a major constraint to production. About a quarter of household heads were farming on land belonging to someone else. Most landless households were secondary households headed by young adults. Half the total number of households inherited land. Only 15 percent had land titles from the state. Market incentives seem to be of more importance than land reform.” (Bangwe, 1997: Section 5.6)

Bangwe found maize yields to be generally well below potential, due to inadequate fertiliser use. Cattle ownership was skewed and associated with high-maize-production households as well as family size (Section 7.28). The epidemic of cattle disease is dramatic: “Middle and high income farmers lost more animals than the poor in absolute terms. But the poor lost more in relative terms. Two poor and one middle household for example lost the whole herd. Negative effects were also felt by the poor in terms of reduced supply of oxen and animal products. More poor people have thus adopted minimum tillage.” (Bangwe, 1997: Section 6.7)

Bangwe asked respondents what they thought constrained their production in specific years: “The changing and dynamic nature of constraints reflects why targeting of technologies and innovations to improve productivity in risk prone semi-arid environments is difficult. Whereas drought and lack of draught power were the most limiting factors during 1994/95, lack of fertiliser took over as most limiting in 1995/96, while drought remained quite important, despite the fact that 1995/96 received moderate rainfall.” (Bangwe, 1997: Section 10.2) (This evidence of ‘moving targets,’ so to speak, as regards productivity constraints suggests a need for longitudinal studies.)

Some potential constraints were interesting for their absence:

“Low emphasis was placed on marketing problems due to lack of a marketable surplus for many households and at increased attempts for surplus farmers to be directly involved in product marketing. Farmers also placed little emphasis on credit because historically, only a small proportion have actually benefited from formal credit. Most farmers felt that supply of inputs was more important than supply of credit. But most farmers have also developed a phobia for credit due to high risks of crop failure, reduced profitability and increased cases of asset grabbing by credit agents. Lack of credit was however, emphasised by some HMP [*high maize production*] households.” (Bangwe, 1997: Section 10.3)

The mention of the importance of input supply as distinct from credit supply may refer to the often-late delivery of seed and fertiliser in a zone where the timing of planting is critical. Marketing problems that were evident soon after liberalisation (see Copestake 1997b) seem to have eased, but then Monze is on the line of rail and well-endowed with commercial infrastructure.

Bangwe analyses determinants of total household maize production, which he takes “as a strong indicator of income and welfare. The key factors that had an influence (high correlation coefficient) on the level of maize produced include; hours in maize (0.90), hours in farm activities (0.89), cropped hectares (0.89), hours in field crops (0.88), family size (0.88), cash income (0.84), number of cattle (0.82) and number of ploughs (0.82). Others were hours weeding (0.80), fertilizer kilos (0.80), number of adults (0.79), number of wives (0.77) and maize hectares (0.75).” (Bangwe, 1997: Section 10.5) Regarding maize yields, “The main factors influencing maize yield per hectare were cropped hectares (0.72), hours weeding (0.68), [total household] maize produced (0.67) and hours in field crops (0.52). There were weak but significant correlations with land held per capita (0.50), hours in maize (0.50), hours making seedbed (0.48) and family size (0.47). There was a notable low association between maize yield and fertiliser applied. This shows that either fertiliser is used inefficiently or not fully applied.” (Bangwe, 1997: Section 10.6) The positive association between cropped hectares and yields contradicts the oft-cited inverse farm size-productivity ratio (see Binswanger et al., 1993), which plausibly holds that smaller parcels are cultivated more intensively and therefore with greater yields. Unfortunately Bangwe does not specify what variables failed to show significant association, and what variables were omitted from data collection altogether.

This study leaves plenty of room for further research: its statistics are basic, it does not report on the use of control variables, its sample is small, and the sample’s purposive selection sacrifices generalisability. Yet it makes important strides in integrating a range of phenomena and variables (land access and use, cattle, fertiliser, labour) and modelling their causal paths to the outcomes of agronomic interest (maize yields) and social interest (household income).

In a parallel study, Waller (1997) focused on the effects of the HIV/AIDS epidemic on farming in Monze District, through interviews with 32 case-study households in late 1996. Coping strategies had already been attenuated by the severe droughts in the early 1990s, loss of cattle to corridor disease throughout the 1990s, and agricultural liberalisation. On top of these, the extended caregiving and medical costs of chronic illness drained household labour and assets even more than a sudden death would have. The effects are gender-differentiated: women are expected to take on the role of primary care giver, on top of their farming responsibilities. This accentuates the labour shortage, which (combined with lack of other inputs) constricts the area cultivated. (Waller, 1997: 49-50)

3.4.4 Role of Cattle and Fertiliser: Deininger and Olinto (2000)

Deininger and Olinto (2000) take advantage of two years of panel data from a large sample (about 5000 households in the Post-Harvest Surveys for 1993/4 and 1994/5) to apply econometric methods to the determination of farm output and area under cultivation. Two years constitutes a short time series, but interesting conclusions emerge. First, fertiliser use is profitable (up to a point) even at higher liberalised prices, and therefore the constraint on its use appears to be access (or perhaps information) rather than price. Second, “Cattle ownership increases income directly, acts as an ‘insurance’ by allowing producers to till their fields in a more timely fashion in times of delayed rain, increases area of land cultivated, and improves access to credit and fertilizer markets. This points towards the persistence of significant imperfections in markets for rural labor, credit, and draught animals, but at the same time suggests that policies to increase cattle ownership in rural areas could have high payoffs.” (Deininger and Olinto, 2000: 3) This elaborates on Bangwe’s finding (1997, cited above) that cattle are associated with greater maize production. Finally, “We find, somewhat surprisingly, that credit has a direct productivity increasing effect – most likely through supervision that is associated with it. This notwithstanding, the main impact of credit is through increases in cultivated area and – as in the case of fertilizer – major benefits are likely to be realized by providing access to producers who do currently not have access to any credit.” (Deininger and Olinto, 2000: 3) These results contribute to the emerging picture of the mutual interaction of fertiliser, credit, and cattle, each of which is also a direct factor in the outcomes of interest (area under cultivation, income).

3.4.5 Evolving Land Rights, Field Scattering, and Investment in Northern and Southern Provinces (Sjaastad 1998)

Sjaastad (1998) researched land and agricultural issues in Northern and Southern Provinces in 1994-95. Using property rights and institutional economics as the theoretical background, he explored investment demand, land scarcity and commercialisation, and causes and effects of field scattering. Data were collected from twelve villages (six each in Northern and Southern Province), totalling 120 households. Village selection in Northern Province was purposive to capture more and less densely populated areas, mainly in order to test the evolutionary theory of land rights (that rights become more specific and individualised as land becomes scarcer; see Ch. 2, Section 2.6). Village selection in Southern Province was apparently based on convenient proximity to the minor market town of Chikankata (in Mazabuka District, 60 km south-east of Mazabuka town). Household selection within the selected villages was random, from an updated village household list. The questionnaires (which varied slightly between the two provinces, reflecting different land use patterns) collected data on: household demographic and socio-economic variables; agricultural production, assets, and exchange; and land (rights,

duration of ownership, mode of acquisition, disputes, and security). Fixed investments were briefly noted but not detailed as to date or cost. Size of fields and parcels, and distances from houses to fields (relevant to field scattering), were measured with pacing, tape measures, and in some cases recent aerial photographs. The author concedes typical potential problems of multiple enumerators / interviewers, differing between provinces, along with possibly strategic responses to sensitive questions (Sjaastad, 1998: 39-43). The context in Northern Province broadly varied from more remote areas where the *chitemene* system of shifting cultivation (necessitated by poor soils for maize) is still practised, to more densely populated peri-urban areas where cultivation is becoming more fixed. In the Southern Province study area, maize cultivation was generally fixed.

The Northern Province data were used to test if land scarcity is accelerating specificity and enforcement of tenure rights (*per* the evolutionary theory of land rights). The general hypothesis is disaggregated into operational sub-hypotheses (such as: “Fallow periods in shifting cultivation will fall as land becomes scarce; ...There will be a transition from shifting cultivation towards more permanent crop systems” [Sjaastad, 1998: 149]) which are tested individually. The statistical procedures include difference in means, correlations, cross-tabulations, and least-squares regression with control variables. Most of the sub-hypotheses are supported by the data. The analysis goes on to explore whether tenure security results in greater fixed investment, greater credit supply, and efficient land transfers; however no firm conclusions could be reached from the data “since the survey immediately revealed the lack of permanent land improvements, the irrelevance of land as collateral, and the restrictions on land alienation.” (Sjaastad, 1998: 190) Vexed questions also arose about how to define tenure security for these purposes. Sjaastad adapts with reservations the language of breadth, duration and assurance from (among others) Bruce and Migot-Adholla (1994); but upon finding that specificity of rights increases with scarcity but security of rights does not, he concludes that (as cited above in Ch. 2): “These conflicting results are a reflection of the problem that although both methods ostensibly measure security of tenure, they in fact measure completely different things.” (Sjaastad, 1998: 165) Unfortunately, since most of the sample was apparently on customary land, obvious tenure indicators like documentation (e.g. long or short leases) were not relevant.

Regarding field scattering, using data from both provinces, Sjaastad finds that having fragmented holdings is not deleterious to maize yields, and that consolidation (reverse fragmentation) happens at a lesser rate than rational risk theory would suggest, probably indicating that succession patterns determine land acquisition in a “gradual, piecemeal manner” (Sjaastad, 1998: 235-236). Regarding land and factor markets, he finds very few land sales in the sample (and those noted were not sales in the usual sense), but many reciprocal

transfers of land and other factors (oxen use etc.), such as fertiliser for labour. Formal factor markets have been unreliable in recent years (late delivery of inputs etc.), and formal land markets were still banned (since the fieldwork took place before the 1995 Lands Act), so reciprocity is important and approximates the former two.

To comment, Northern Province was a good location to test the evolutionary theory, since it seems to be in a transition from shifting to fixed cultivation (or at least maintains each in different zones). The Southern Province study area, being adjacent to settlement schemes on State land, seems to have afforded a missed opportunity to compare State and customary tenure. Also, the time spent on collecting geographical data on field scattering (distances to fields, etc.) sacrificed other potentially interesting areas of data, such as details on fixed investments. The study makes important strides, though, in bringing to bear a conceptual framework that is more sophisticated, flexible, and adaptable to local conditions than the restrictive neo-classical model.

3.4.6 Unequal Access to Land (Zulu et al. 2000)

Zulu *et al.* (2000), using data from the national Post-Harvest Surveys (PHS) and Crop Forecast Surveys (CFS) through 1997/1998, identify unequal access to land as a key determinant of unequal incomes, in remote rural areas as much as more commercialised farming zones:

“These results indicate that the value of crop production is highly related to the distribution of cropped area, i.e., the skewness of land allocation is driving the skewness of income derived from crop production. While data on household non-farm income are not contained in the CFS or PHS surveys, and such information must be obtained to make any firm conclusions, these findings begin to suggest that limited access to crop land at the household level may be a key factor associated with rural poverty. As mentioned above, the variation in land cultivated per capita holds even at the district level, as does the relationship between crop income and land cultivated, indicating that the determinants of rural poverty are perhaps a household-level phenomenon as much or more than a geographic one (i.e., related to geographic isolation and lack of access to infrastructure). This is the topic of ongoing research.” (Zulu et al., 2000: 29)⁶²

This is an interesting finding especially as it is at odds with a general impression of land distribution under Zambia’s customary land regimes, which are thought to be egalitarian, especially in the more remote areas like Northwestern Province. (Also, like Bangwe [1997, cited above], this finding contradicts the hypothesised inverse farm size-productivity ratio.) However it needs, as the authors suggest, further research. Their study has unearthed a perhaps surprisingly unequal distribution of area under cultivation (per capita), and a related inequality in crop output value per capita. But several possible explanations for this go

⁶² The mentioned ongoing research was not yet published at the time of this writing.

unmentioned. There is an implicit assumption that area under cultivation equals farm size; in other words, that people are cultivating all the hectareage that they own or to which they have access. However it is easy enough to imagine that some people cultivate only a portion of their available land, for instance because of lack of inputs (seed, fertiliser, animal traction and ploughs, labour). What Zulu *et al.* may actually have uncovered, then, is unequal use of or access to inputs, causing in turn unequal area cultivated.⁶³ Another possible explanation arises from their use of crop value per capita as the dependent variable, rather than straight yields of a single crop (like maize). This is wise, as it allows outputs of different crops to be aggregated and compared (e.g. maize farmers, cotton farmers, and those who do some of each). But it must consider the potentially dramatic differences in output value per hectare of different crops. If cotton, for instance, tends to produce several times more market value per hectare than maize, then the advantage of large farmers in value-labour productivity (production value per unit labour) may stem simply from their planting a higher proportion of cotton on their farms, as they plausibly might.

Zulu *et al.* consider that their findings

“...could imply that many of the benefits of liberalization of the agricultural sector could be accruing to only a relatively small proportion of farming households...It could also be deduced that public intervention in the agricultural sector based on the conventional wisdom that agricultural production could be boosted mainly through improving farm yields, demonstrated in the various fertilizer programs over the last 30 years, could be, at least in part, an inaccurate diagnosis to the problem. The data suggest that there is an important link between production and land holding size, suggesting that programs aimed at increasing access to land for those households cultivating little area may be an important element in rural poverty reduction strategies...From the above preliminary analysis, it appears that land use and land access among smallholder farmers is an important factor that influences production, income and, hence, food security.” (Zulu *et al.*, 2000: 29-30)

3.4.7 Conclusions

These studies produced some indications that land tenure affects farm performance in Southern Province, but considerable refinement is needed to grasp tenure security (especially comparing statutory vs. customary tenure) and farm performance. Fixed investments, especially, need to be measured on a continuous not binary scale. Outcomes other than maize yields must be explored in this livestock-dependent area, as must the links among cattle ownership, credit, fertiliser, and productivity suggested by Deininger and Olinto (2000). What appears to be

⁶³ The PHS questionnaire (Food Security Research Project, 2000) asked only for area cultivated per crop; it does not ask about temporarily uncultivated fields or portions thereof. The questionnaire for the Supplementary Survey (Central Statistics Office, 2001) commissioned to explore these land access questions (among others) in light of Zulu *et al.*'s findings (2000), does enumerate uncultivated fields and uncultivated portions. Results are not yet published.

unequal access to land may actually be unequal access to inputs (seed, fertiliser, labour, animal traction) that in turn constricts area under cultivation irrespective of area owned. Sampling and study areas must be carefully designed in line with the topics of interest: in particular, it seems opportune to compare farmers on State and customary land. These empirical questions that are more or less specific to the Zambian context intersect with the broader theoretical questions reviewed in Chapter 2 (effects of disaggregated land rights on supply and demand incentives; better measures of productivity than yields in land-abundant settings; attributes of titles or other legal instruments; availability and purpose of fixed investment technology) and impel further research that may yield results that are relevant to both theory and policy.

Chapter 4: METHODOLOGY

4.1 Objectives

This study stems from the on-going debate (summarised in Ch. 2) as to whether customary African land tenure must be reformed or converted to a statutory, individualised land tenure system (often referred to as a ‘titled’ system) as a pre-requisite to agricultural development. Past arguments in favour of titling claim that traditional tenure is insecure for the small farmer and thus creates disincentives for land improvements; that it prevents land from being used as collateral for credit; and that it prevents the transfer of land from inefficient users to efficient ones. Counter-arguments point out that farmers under customary tenure usually have durable usufruct rights, that credit is often inaccessible even where titles exist, and that informal land markets do operate to make land available to efficient users (whereas formal land markets are sometimes seen to have the opposite effect).

A parallel debate, which this study also seeks to address, concerns African land tenure systems aside from customary ones, namely those administered under statute by national governments. The experience of southern Africa in particular contains high-profile cases where land alienation (mainly though not entirely during colonial periods and for the purpose of European colonisation) removed significant land areas, often comprising the best agricultural lands, from the control of customary polities and placed them under statutory tenure. Redress of this alienation has often taken the form of resettlement of African farmers on lands previously held by farmers of colonial origin. The forms of Western-based statutory tenure under which farmers of colonial origin held land, particularly freehold, bore some disrepute and were not automatically adopted by post-independence governments. The question therefore arose as to what types of tenure should be adopted and offered to resettled farmers—freehold, long or short lease, some sort of re-instituted customary tenure, or others—and what would be the effects of each of the options, on farmers’ micro-economic incentives, on the macro-economy, and on social welfare and equity. (The political interests of the post-independence polities inevitably were and are a further consideration.) How do different types of statutory tenure perform vis-à-vis each other and customary tenure? In an era when major contention over redistribution and resettlement is ongoing in southern Africa’s most important economies (Zimbabwe, South Africa), and post-war reconstruction in others is prompting national debates on land tenure (Mozambique, Angola), these questions are timely. The objective of this study is therefore to identify and measure the effects of land tenure on farming and socio-economic performance, in a zone that is broadly characteristic of southern African farmland, with

particular attention to comparing statutory and customary tenure, as well as variations of tenure within each.

4.2 General Methodological Approach

The literature on African land tenure is extensive and in some ways up-to-date; yet, as was outlined above in Chapter 2, there is some room for improvement in the ways hypotheses are tested. A more thorough disaggregation of the differential effects of various land rights needs to be incorporated into the testing. Better contextual categorisations of variables need to be applied (e.g. what is a short-term vs. long-term input). Comparison of the behaviour of farmers under different degrees of tenure security need to be assessed with the understanding that the actual variability of tenure security in most study areas is quite constricted: for instance, none of Bruce and Migot-Adholla's study areas had titles with all the attributes deemed necessary to activate the claimed economic logic (e.g. Kenya, where titles are not considered secure collateral by lenders). Hunt (2001) aptly pointed out that there is a difference between the effects of titles (or any legal instrument) that are attributable to the nature of the instrument, and those attributable to the way in which the instruments are administered and adjudicated. Additionally, a comparison between farmers under statutory tenure and those under customary tenure must carefully control for other socio-economic variables that may precede and affect tenure status; and the sample must cover the variability of tenure statuses within each of the two categories. Also, if the purpose is to discover which land rights are most important to farmers, one should not overlook the direct route of asking them.

How to design a study to address these issues with these new points in mind? The ideal study area would have a patchwork of different tenure systems (or degrees of tenure security) side by side on land with similar physical attributes. The effect of sampling over a concentrated patchwork is to help control for factors aside from land tenure that might affect farming systems and performance, e.g. soil quality, distance to market, and vagaries of weather. For example, Carter *et al.*'s Kenya study found that market access and parcel quality were confounding variables that affected both title status and farm productivity: farms closer to market and with better terrain tend to be more productive, and also tend to seek title, and also benefit more from that title. Hence in terms of separating out tenure security's effect on farm productivity, their study was inconclusive. "More complex analysis, which tries to control statistically for mediating factors such as market access, is required. The ease with which that task can be done depends critically on whether the relevant farm characteristics are measured and measurable. It may be relatively simple to control for market access: prices, wages and interest rates can be readily observed. But farming skill and land quality—which, like market

access, would enhance the returns to land titling—are much harder to measure and to control for.” (Carter *et al.*, 1994: 153)⁶⁴ Perhaps, but rather than the more complex statistical controls for, and difficult measurements of, terrain quality that Carter *et al.* recommend, an alternative is to choose a geographically concentrated and topographically homogenous study area, where terrain quality can plausibly be assumed constant. Such an area, if it also has different land tenure systems existing side by side, allows the analysis to isolate the effects of land tenure.

Zambia’s Southern Province is one place where such different systems exist side by side. In addition to being the major maize-growing region of Zambia, its land situation is a patchwork of customary tenure areas and those under long leasehold from state ownership; thus there is important variability in tenure status. Its small farmers have a history of semi-commercial farming, and a relatively high degree of exposure to credit and inputs such as fertiliser and hybrid seed. Since the 1950s, settlement schemes on State lands have installed small and medium-sized farmers under leasehold, in areas adjacent to customary lands. It may therefore be justifiable to assume constant attributes of parcel quality that may otherwise confound the causal path between tenure status and farming performance. Variability of tenure can also be found within both State and customary lands, especially the former: some State-land farmers have long leases, others short leases, and others no documented rights at all.

So the study design, most generally, is to survey and compare farmers on State and customary lands, as well as within each stratum. It is therefore best described as a case study designed as a pseudo-experiment.

RESEARCH QUESTION: Do different land tenure conditions affect farming systems, organisation and performance among small and medium-sized farmers in Zambia’s Southern Province, and if so, how?

This question is made operational through a series of testable hypotheses and sub-hypotheses:

HYPOTHESIS A: Farmers with greater tenure security have accumulated greater fixed investment on their land.

A.1. Farms on State land have greater mean fixed investment than farms on customary land.

⁶⁴ While prices, wages and interest rates may be simpler to observe and control for than land quality and farming skill, it could be argued that they are hardly straightforward in the SSA context.

A.2. Farms on State land that have titles, have greater mean fixed investment than farms on either State or customary land that do not have titles.

HYPOTHESIS B: Farms with greater tenure security have greater productivity of field crops.

B.1. Farms on State land have greater productivity (per hectare and per unit labour) than farms on customary land.

B.2. Titled farms have greater productivity than untitled farms on either State or customary land, through intervening socio-economic and agronomic variables.

HYPOTHESIS C: Farms with greater tenure security have higher credit use than farms with lesser security.

C.1. Titled farms have higher credit use than untitled farms.

HYPOTHESIS D: Children of farm households with greater tenure security have different socio-economic trajectories.

D.1. Children of titled households have higher educational attainment.

D.2. A greater proportion of children of such households obtain salaried jobs.

The methodological approach is predominantly quantitative, with an important qualitative element that is necessary to put the quantitative results into context and to elucidate perceptions, incentives, and causal mechanisms. This is in line with important previous studies in Zambia and elsewhere in sub-Saharan Africa (Bruce and Migot-Adholla 1994, Place *et al.* 1995, Sjaastad 1998 among others). This study takes as its ultimate interest and target social goals such as income and equity (i.e. well-distributed growth of incomes), which admittedly have non-quantifiable dimensions, but which are hard to describe and measure without quantities.

This study shares a broadly similar approach to the three above-mentioned, but differs in several ways. The study area and sampling (more below) is focused and selected so as to allow for contrasts between farmers on State and customary land who apart from land tenure are as comparable as possible.⁶⁵ The information gathered on key outcomes like fixed

⁶⁵ In Sjaastad 1995, the Southern Province part of his study included a survey, parts of whose sample covered settlement farmers, but apparently not with high enough frequencies to allow easy comparison within their ranks or with customary farmers. Place *et al.* 1995 is similar.

investments is more detailed and allows for analysis of different types of investments aggregated together, as well as occurrence of individual types (like wells). Data on additional outcomes such as household income and offspring's educational attainment and work are collected and included in the analysis.

The major part of data collection for this study was a household questionnaire survey. The questionnaire covered household socio-economic characteristics, crops, yields and revenues for the past two seasons, credit history going back five years, use of inputs and labour, tenure status and perceived land rights and security, incidence of disputes, incidence of fixed investments including soil conservation, and modes of access to land. Open-ended comments and elaborations by respondents were fully recorded. The survey information is supplemented by secondary data from local key informants, officials, recent surveys, and censuses.

The survey data are cross-sectional. Although the advantages of time-series data are easily imagined for land tenure studies, such was infeasible in this study. The questionnaire did aim to approximate time-series data in some dimensions, by recording for example accumulated fixed investments including those going back to 1975, and looking forward to offspring's socio-economic trajectory via their educational attainment and profession.

It is important that the questionnaire puts at least as much emphasis on opinions and perceptions as it does on what respondents have actually done, because the disruptions in the agricultural sector following privatisation in the mid-1990s, coupled with droughts and livestock disease, can be expected to have severely constrained small farmers' ability to put their preferences into action.

4.3 Conceptual Framework

The conceptual framework places land tenure alongside a series of factors for outcomes of interest (income and offspring's socio-economic trajectory) within the study population. Such factors include, generally, socio-economic characteristics of the head of household and other household members. The conceptual framework should also include agronomic variables, as these obviously have a bearing on farm production: soil or terrain quality, rainfall, planting density, use of fertilisers (chemical or organic), seed type (hybrid vs. local maize, as well as higher-value crops such as cotton), etc.. Data on all of those agronomic variables are collected and included in the analysis except soil quality and rainfall, as the means did not exist to measure these for each household; the concentrated geographical focus is instead used to improve the likelihood that these factors are constant throughout the study area.

Social structures and relationships may affect the outcomes of interest: for instance, Sjaastad (1998, cited in Sections 3.3.1.1 and 3.4.5) found reciprocal, non-market transfers (usually based on social relationships) of inputs such as fertiliser and land to be common in Southern Province. In keeping with previous studies, however, this study does not attempt to place such structures and relationships in the conceptual framework (which, it will be shown below, is already dense), nor to measure them in the data collection, in the interests of keeping the framework and the number of variables manageable, and on the argument that such socially-based factors are unlikely to render invalid the findings on the key independent variable of land tenure. To explain the latter point, inputs are generally measurable, through respondent recall, and inter-household allocation of or access to inputs (seed, fertiliser, labour, seasonal land, animal traction *inter alia*) could similarly be derived from detailed interviews. However many of the putative factors likely to affect differential access to inter-household channels of inputs (kinship, or other relationship of reciprocal obligation or favour, to households with surplus inputs to distribute; prestige or desire therefor; etc.) are much more difficult to measure, because they are both intangible (and not amenable to measurement by proxy) and highly embedded in social relations that are hard for the outsider (other than the trained anthropologist, perhaps) to discern and describe. Some of the likely manifestations of socially-based access to inputs, such as borrowing of animal traction, are measured and analysed in this study. Otherwise, the under-representation of most social structures and relationships from the conceptual framework and data collection is a limitation, but not one that undermines the validity and utility of the study as it was conceived and carried out.

Intra-household phenomena are also likely to affect the outcomes of interest, as discussed in Section 2.16, and therefore would ideally merit a place in the conceptual framework. The rationale and potential limitations of this study's choice of the unitary 'household' as a unit of analysis are discussed in Section 4.4.5.

There are intermediate outcomes such as productivity (per unit of land, seed, or labour), cattle ownership, credit use, and area under cultivation (which as will be demonstrated is not coterminous with parcel size, due in part to supply constraints of inputs and animal traction). It will be argued that productivity, or yield, of field crops (as opposed to horticulture), which in previous studies has been presented as the outcome of interest (as in Blarel 1994), is actually better considered an intermediate outcome. The link between productivity and income is not to be assumed (for example, it may be tenuous if the cost of fertilisers is sufficiently high to subtract from net income even as they boost land productivity). Productivity as a measure of economic performance also only makes sense when applied to a scarce input: a farm with a hundred ploughs and only one ox is best assessed on productivity per ox, not per plough. This arises in the study area, especially on settlements, where it will be shown that land is in some

cases (at least temporarily) under-utilised (because of input constraints, as mentioned). Also, field crop productivity is only useful as an indicator of farm performance (therefore income, therefore welfare) if farmers are making (or trying to make) most of their money from the field crop(s). If other activities such as livestocking or off-farm employment are more important sources of income, then field-crop productivity is not the most important outcome. Finally, there is a potential problem of adverse selection in the link between fixed investments and productivity: poor, naturally unproductive land may receive the most attention in terms of fixed investments (e.g. drainage works, manuring), and so may be brought up to acceptable but unexceptional productivity. This would result in data associating investment with relatively low productivity—no doubt an interesting phenomenon if real, but not one that should be used to refute a hypothesised link between fixed investment and farm performance.

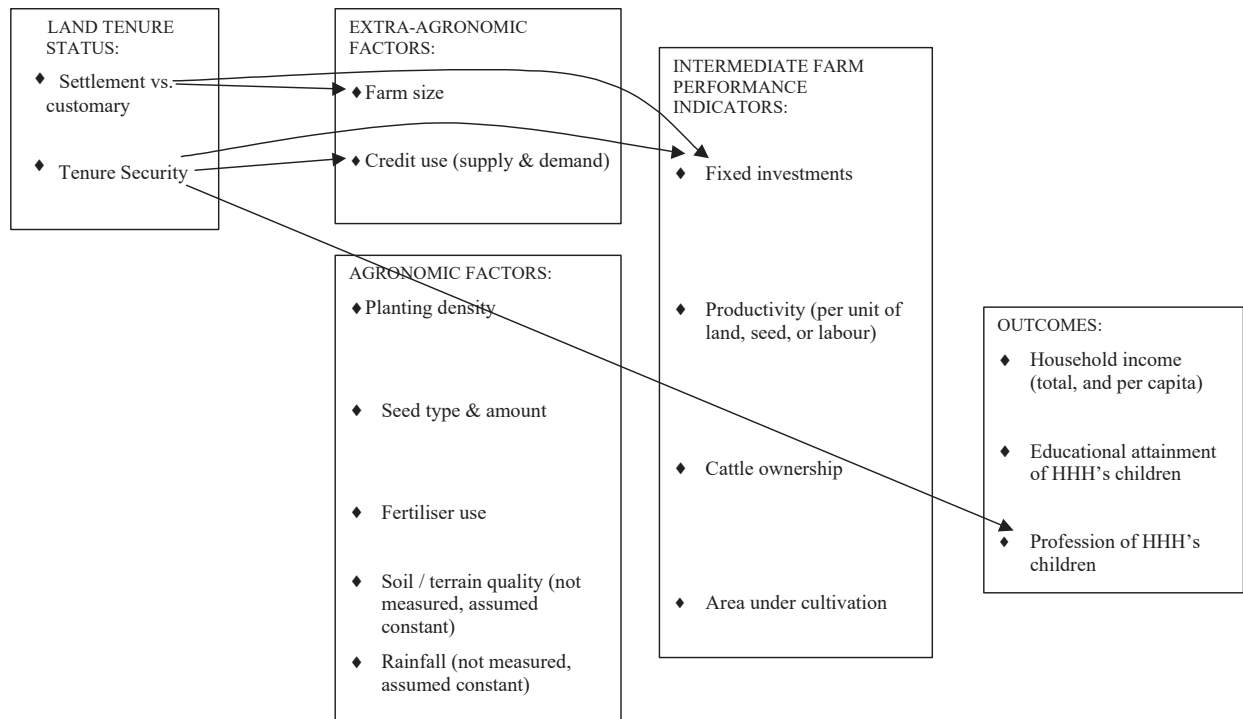
The conceptual framework can be diagrammed as a causal series in four stages, which correspond roughly to chronology. The series begins with antecedent factors, including the factor of interest: land tenure status. Potentially confounding antecedent factors, such as HHH (head of household) educational attainment, will also be placed in the first column (but initially are omitted from the diagram for clarity).

The second stage factors are grouped for convenience as agronomic or extra-agronomic. Planting density, seed type and amount, fertiliser use, soil or terrain quality, and rainfall are defined as agronomic factors. (The latter two were not measured and are assumed constant.) Extra-agronomic factors include farm size and credit use (which contains dimensions of demand and supply—how much credit is available, and how much farmers are willing to take on the terms offered).

The third stage is termed intermediate farm performance indicators; these comprise fixed investments, productivity (of land, seed, or labour), cattle ownership, and area under cultivation. As explained above, although these are largely outcomes of the preceding stages, there are substantive reasons for not stopping there and assuming that they should be the outcome of interest; for example per-hectare productivity may have little to do with eventual household income. That, as well as offspring's educational attainment and profession, form the fourth and final stage.

Because of the number of factors and their dense interactions, the diagram is presented in layers for clarity. First, the postulated direct effects of land tenure status appear thus (Figure 4.1):

Figure 4.1: Postulated Direct Effects of Land Tenure



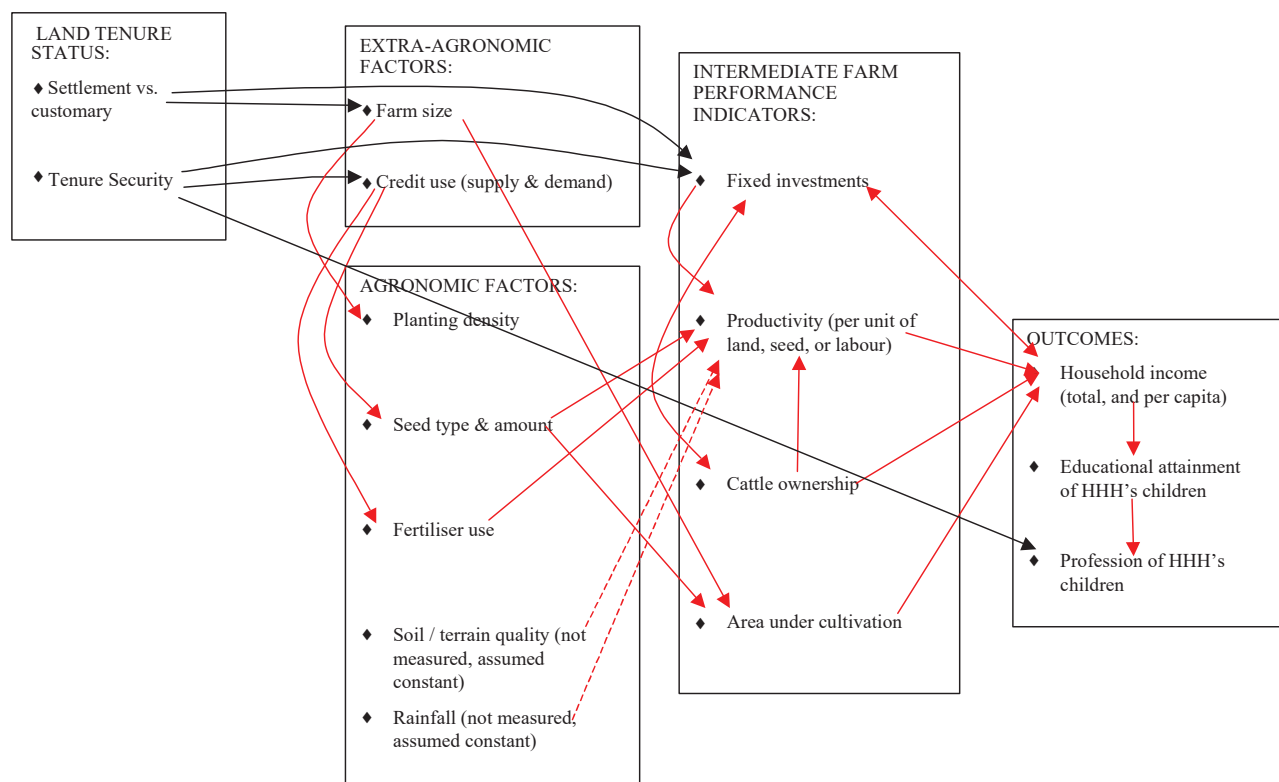
Land tenure status is divided into two dimensions: ‘settlement [i.e. State] vs. customary,’ and ‘tenure security,’ because the dimensions have distinct postulated effects.⁶⁶ ‘Settlement vs. customary’ has an effect on farm size because settlement parcels were designed to be larger than customary farms. It also affects ‘fixed investments’ because settlement farmers were administratively encouraged or required to install improvements like fencing and improved houses, apart from any *sui generis* economic reasons to do so. Such factors, which do not stem from tenure security as such, must be considered in analysis, as they may confound tenure security’s effects. Those effects are postulated to include increased fixed investments, increased credit use, and children’s profession. Increased fixed investments would result from increased demand by the landholder, above what she or he would rationally choose to install with insecure tenure. Increased credit use would stem mainly from supply response to offering land as collateral (though in some African credit markets, land collateral is not trusted by lenders). It may also increase credit use if such credit is sufficiently long-term to be used for fixed investments (hence tied to increased demand for fixed investments), though it cannot be assumed that supply of long-term credit exists even with land offered as collateral. (It was

⁶⁶ All effects diagrammed and discussed in this section are postulated, but the word will henceforth be omitted to reduce repetition.

argued above in Chapter 2 that the credit demand response of tenure security, sometimes sought in research, theoretically does not apply to short-term credit.) Lastly, tenure security may affect children's profession: secure inheritance of farmland may influence them to become full-time farmers, and conversely poor security of inheritance may convince them to develop other livelihoods.

The arrows multiply if the diagram adds the indirect effects of land tenure, i.e. the strings of causation that emit from the factors directly touched by tenure. In the following second layer of the diagram (Figure 4.2), such effects appear in red:

Figure 4.2: Postulated Indirect Effects of Land Tenure



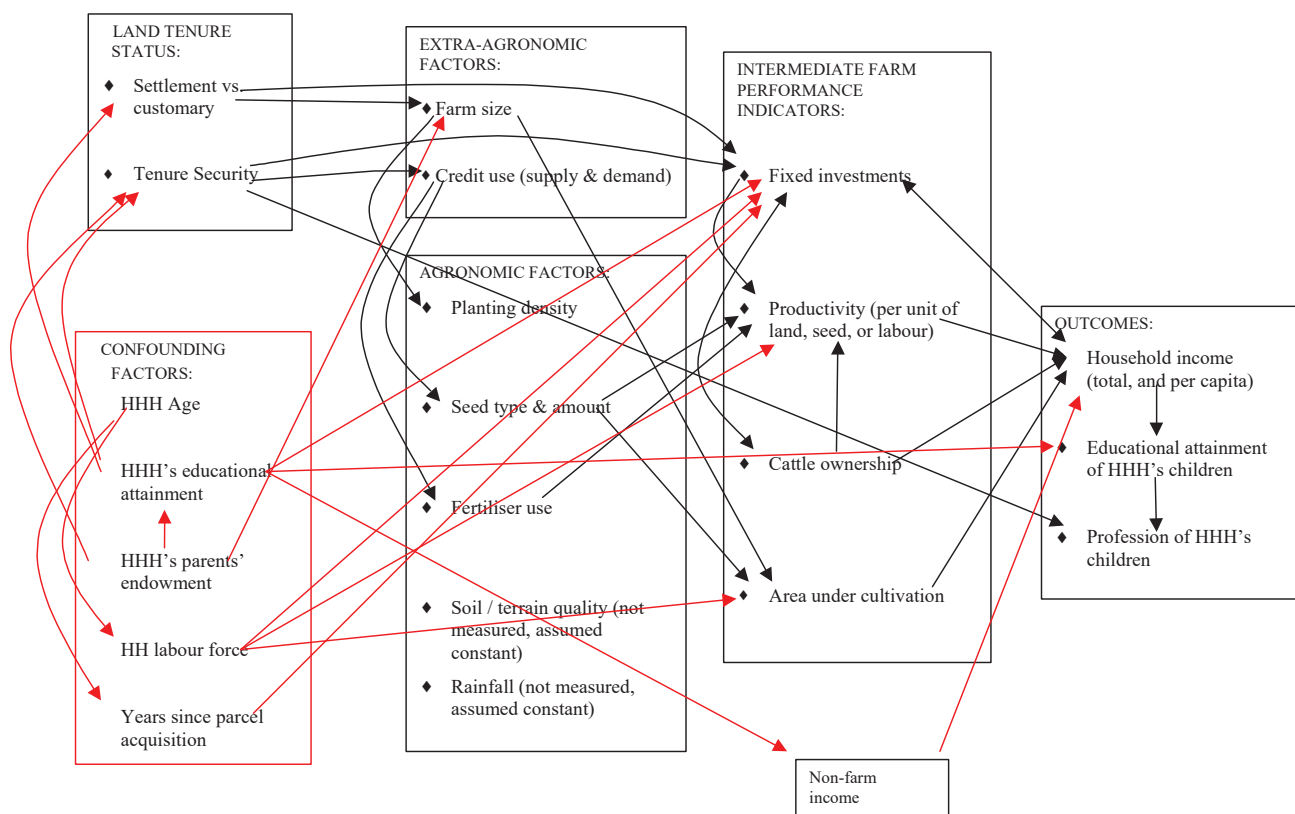
To follow some of these causal strings: credit use affects seed type (obtaining hybrid as opposed to local maize) and amount; these in turn affect area under cultivation and productivity, each of which affects household income. Credit use can also increase fertiliser use, which in turn affects productivity. Farm size obviously affects area under cultivation, though the two are not necessarily identical.

There also appear interactions among the intermediate farm performance indicators. Fixed investments may affect productivity, if they save labour or enhance field production. Cattle ownership can improve labour productivity, through ploughing. Fixed investments and cattle may also interact, if for example fencing and wells are needed to increase herds.

As for the outcome column, area under cultivation and productivity obviously combine to constitute a part of household income. Cattle ownership may have a two-way relationship with income: more income may result in more cattle buying, but cattle can also contribute to income (sale, slaughter, hiring out for ploughing, or dairy). The same applies for fixed investment: some, like fruit trees, may contribute directly to income, and increased income may be used to add to fixed investment. Income is also presumably a prime determinant of children's educational attainment, which in turns influences children's profession.

So the postulated effects and causal paths of land tenure are multifarious, and we have not even added the confounding factors yet. (It seems likely that the data will show that some of these postulated causal strings do not actually operate in the study area; for example it may turn out that fixed investments do not contribute directly to income, as one would expect if the investment were something like a concrete house.) The complete diagram (Figure 4.3), now including confounding factors and their resulting strings (in red), appears thus:

Figure 4.3: Effects of land tenure, with confounding factors added



HHH age may add to HH (household) labour force (older → more offspring) and to ‘years since parcel acquisition’ (older → likely more years).

HHH educational attainment may increase the likelihood of being on settlement rather than customary land, as settlement farmers were selected for various aptitudes. It may also be associated with tenure security, by influencing success in negotiating the process to obtain titles, leases, or other forms of security. Down to the other stages, HHH education may increase appreciation of, and ability to install, fixed investments; may affect her/his children’s educational attainment perhaps through an appreciation of education; and may increase non-farm income, for example through a past or present salaried job.

Endowment received by the HHH from her/his parents is conceptually meant to cover an array of possible inter-generational advantages. In this study, it is derived as an index of father’s land holdings and father’s educational attainment. (Other factors could certainly enter into the concept with validity, but limitations of respondent recall would have produced too many missing values for useful analysis.) In this scheme, endowment from parents is thought to influence: HHH’s own educational attainment; tenure security (if the parents’ landholdings were under secure tenure and were bequeathed); and farm size (obviously influenced by father’s landholdings, though not automatically equivalent).

Household labour force is a potentially key variable in this study area with largely un-mechanised farming (and, as we shall see, a current shortage of animal traction). It can directly influence fixed investments (especially those that are labour-intensive); productivity (more labour can lead to more production per hectare and per seed); and area under cultivation (more hands, more hectares tended).

Finally, years since parcel acquisition may directly influence fixed investment: more years may allow accumulation of more improvements. It may also negatively influence soil quality, if fertility is lost from erosion and lack of fallow; but soil quality is not measured in this study and therefore this possible causal string is not analysed.

Other relationships among the variables can be imagined, but more arrows would clutter the diagram even further, and the existing arrows are thought to cover the important links. The essence of the analysis will be to test which, if any, of the direct and indirect effects of land tenure actually operate in the study area, and whether they still obtain when the confounding factors are controlled for. Ultimately, looking at the stage of outcomes, the analysis will

attempt to determine the most important contributors to the outcomes of interest, and thereby test whether land tenure is of substantive importance.

4.4 Research Design

4.4.1 Types and Sources of Data

The research design is in two main parts: cross-sectional survey data, and key informant interviews.

Data on the items in the conceptual framework were collected mainly through the survey questionnaire, which covered: land tenure status (documentation, mode of acquisition, perceived security); household socio-economic attributes; agronomic data (inputs and outputs of cropping for the current and previous season, including land, seed, fertiliser, and labour⁶⁷); credit use; fixed investments; livestock; other income. A major part of the questionnaire also sought opinions and perceptions on land issues, such as: which particular land rights are most important; under what terms would the respondent accept credit; does the tenure situation discourage the respondent from installing fixed investments; etc. (The full questionnaire appears in Annex 3.)

Key informant interviews (detailed below) served the purpose of providing context for and suggesting interpretations of the survey data, as well as describing the wider policy picture. They also served as a double-check on the survey data's reliability and validity.

4.4.2 Questionnaire Pre-Testing

The questionnaire was pre-tested with three households in rural Lusaka province plus three in Monze district, in the presence of the author. The major changes following this pre-test were to add pre-coded responses to certain open-ended questions, with the aim of eventually facilitating analysis.⁶⁸ Note that all such questions included a code for "other," which the enumerators were to specify in writing, to keep the questions truly open-ended.

Another change made after pre-testing was the introduction of a separate answer sheet. This was mainly to economise on photocopying costs (since the full questionnaire is 24 pages,

⁶⁷ Bangwe (1997) interviewed households in 1995 and asked them to recall crop data from as much as five years previously, which he was then able to check with contemporaneous data from a previous survey with the same households. "With strategic prompting, most respondents appeared able to remember back even to the pre-election harvest of 1990/91, with generally relatively small discrepancies between their recollection and the estimate supplied in 1991 itself." (Bangwe, 1997: Section 4.4)

⁶⁸ For example, on question 4.8, "Why did you not apply for it [loan this year]?" some respondents in the pre-testing responded that the repayment period was too short; therefore this response was added as a pre-coded option.

mostly due to the extensive pre-coded responses). It carried the risk of enumerators misplacing answers, so answer boxes were rearranged at the end of pre-testing to solve trouble spots. Also, boxes were added to enclose follow-up questions that only applied following a certain response.

4.4.3 Translation

The main translation issue for this questionnaire was the expression of terms (usually those related to land tenure studies) that have no obvious equivalent in Tonga, or worse, have an apparent equivalent that may turn out to be misleading. Terms like ‘tenure security,’ ‘fixed investments,’ and ‘incentives’ were troublesome and required re-phrasing because direct translation from the English would not work. The author enlisted the help of the survey enumerators (university graduates from Southern Province whose first language was Tonga) to identify and agree the best translations. It was decided that consistency among the enumerators was more important than any particular option for translating a term, because comparability around the sample was the goal.

Because Tonga is seldom rendered in formal writing, it was decided not to attempt a written translation of the questionnaire, but instead to rely on spoken translations arrived at and practised jointly by the enumerators. This follows the practice of the annual Post-Harvest Survey, implemented country-wide by the Zambian Central Statistics Office, rendered verbally into various local languages from a questionnaire in English.

4.4.4 Sampling and Response Rate

The districts of Monze and Mazabuka were selected on the basis of:

1. The existence of a large number of small and medium farmers on settlement schemes geographically interspersed with (putatively) similar farmers on customary lands;
2. The fact that this area covers a large part of Zambia’s most important maize-growing region, where one might expect demand and competition for farmland to be relatively intense, and hence tenure security issues more acute.

Because the study had an innovative design in which State settlement households were to be compared with neighbouring households on customary land, sampling promised to be pivotal. The first step was to obtain a suitable sample frame of farming households. Census data were not automatically suitable: data from the recently completed 2000 national census were not yet available, and those from the previous 1990 census would have had to be laboriously updated. A shortcut was identified: the annual Post-Harvest Surveys (‘PHS’), designed by the Food Security Research Project and implemented by the Central Statistics Office. That series takes advantage of the structures of the decennial census and uses a pre-selected, representative set

of Census Supervisory Areas (CSAs) in each district in the country, which are re-visited each year. Before each Post-Harvest Survey, the population list of each CSA is updated, and from this sample frame 20 households are randomly selected in each CSA. The objective is to approximate a random multi-stage sampling, with the first stage (that of selecting CSAs) being slightly non-random in that they are selected in order to be sure to include areas specialising in certain rarer crops that otherwise risked being under-represented in a truly random selection of CSAs.

The sampling method of the 1997/98 PHS was summarised in a subsequent review:

“A stratified multi-stage sample design was used for the Zambia PHS. The sampling frame was based on the data and cartography from the 1990 Census of Population, Housing and Agriculture. The primary sampling units (PSUs) were defined as the Census Supervisory Areas (CSAs) delineated for the census. The CSAs were stratified by district within province and ordered geographically within district. A total sample of 405 CSAs was allocated to each province and district proportionally to its size (in terms of households). A master sample of CSAs was selected systematically with probability proportional to size (PPS) within each district at the first sampling stage; the measure of size for each PSU was based on the number of households listed in the 1990 Census. The secondary sampling unit is the Standard Enumeration Area (SEA), defined as the segment covered by one enumerator during the census. One SEA was selected within each sample CSA with PPS for the survey.” (Megill, 2000: 3)

Automatically, then, households selected for the PHS are drawn from an up-to-date frame of farming households in the census zone, with a well-documented and approximately random selection method. The same households could be re-visited for the current study.

It would have been convenient if the PHS sample had comprised roughly similar proportions of State land and customary land farmers; however it included only a handful of households on State land, presumably because they are greatly outnumbered by farming households on customary land. It was therefore necessary to match the PHS part of the sample with an equivalent stratum on State land.

To improve comparability, it was best to focus on settlement schemes whose farms are most similar to customary farms. Therefore, within the study districts, certain settlement schemes were selected for survey on the basis of:

1. Having the smallest average farm sizes of the settlement schemes in the study area;
2. Having a settlement population originally selected at least in part from neighbouring communities on customary lands.⁶⁹

⁶⁹ Records of current ownership or occupation, being very incomplete, give no indication of the origins of current owners/occupants; but some archives from the times of settlements' establishment indicated whether an effort was made to select farmers from adjacent villages, usually to mollify feelings about access to land.

Ideally, household selection within the selected settlements would have been random, i.e. would have used a random selection method on a complete sample frame comprising the entire populations of the settlements. However, records on settlement occupation were out-of-date or inaccessible, making it impossible to construct a sample frame of principal settlement holders with archival methods. Nor was it feasible to enumerate physically the entire population of the selected settlements. Also, it became clear from initial inquiries that a large minority of households on the settlements were not those of the principal holders but instead comprised their invitees—relatives and extended family, or (one suspects) renters. There was no plausible prospect of performing an inventory of these households since their presence is not officially recognised or sanctioned. A national census might have revealed them, but the 2000 census data were not yet available at the time of this study, and the previous 1990 census could not be considered up-to-date for these purposes. There was therefore little choice but to use a non-random selection method within the settlements: traversing the settlement scheme and identifying households within sight of usable roads, selecting any where there was a suitable respondent at home (either the head-of-household or another adult household member who could answer the questions), up to a quota of about 20 households per settlement scheme. (This method was less spatially biased than might have been the case with a village where houses are clustered: on the settlements, parcels and their houses were designed to be, and still are, evenly spread out along the roads.)

On the customary side, Monze and Mazabuka districts each have six or seven CSAs in the annual PHS sample. Rather than covering all of those, the current study selected those CSAs that are geographically closest to the settlement schemes, so as to maximise the comparability. This resulted in five CSAs being selected. The same respondent households selected for the most recent PHS were then re-visited and interviewed with the current questionnaire, as were the settlement households.⁷⁰

In this way, households on settlement schemes selected for being most like customary farms (and, in a sense, least like settlement farms) were mated with customary households that had been (approximately) randomly selected and were nearby. This focused approach sacrifices generalisability, in that the sample universe can be said to comprise only farming households in the selected settlements and in the customary areas selected for geographical proximity thereto. However, it is highly unlikely that the results obtained from this sample do not apply in large part to wider farming populations in this agro-ecological zone in Zambia.

⁷⁰ It is conceded that the fact that the customary-land households had already been interviewed on similar subjects within the preceding twelve months, while the settlement households to the study team's knowledge had not, may theoretically confound the comparison.

SAMPLE SIZE: The sample size was determined by the estimated proportion of critical variables and the need to detect substantively interesting differences in proportions. Since a large number of variables would result in an infeasibly large sample size, fixed investments was selected as the critical variable for these purposes. The nature of available formulae requires that some advance estimate of the prevailing proportion of the variable of interest in the study population be applied. Data on fixed investments do not exist in any available sources in the degree of detail envisaged by the current study, but cruder data were available. According to Place *et al.* (1995), the occurrence of “any earthworks” in the Southern Province part of their sample is 31%; “any water improvement” is 44%. (Place *et al.*, 1995: 163) The average of these is 37.5%, rounded up to 40%. The formula to derive ideal sample size for calculating differences in proportion among strata is given in Poate and Daplyn (1993: 74). The expression is:

$$n = 2z^2p(100-p)/d^2$$

where n = sample size per stratum, z = z value for the 95% confidence level (1.64 one-sided, 1.96 two-sided), p = proportion of the variable of interest in the whole population, and d = minimum percentage difference between strata that we wish to detect. To explain the d expression, a one-percent difference in occurrence of fixed investments between strata seems not very substantively interesting, whereas a difference of 10 or 15 percent begins to be interesting. We therefore set the d value at 0.15. The p value reflects the pre-estimated overall population proportion; in this case we can use the approximately 40% occurrence of any earthworks or waterworks reported in Place *et al.* (1995). The one-sided or two-sided options for the z value refer to whether the searched-for effect is certain to go in one direction, or may possibly go in either; for example, whether being on State land certainly associates with equal or greater fixed investment, or may possibly turn out to associate with lesser investment. The conservative option is to choose the two-sided value (which increases the ideal sample size somewhat, as z is in the numerator). We therefore set the z value as 1.96.

With these values, the formula yields an ideal sample size per stratum of 81.95 (rounded to 82). There remains to define the number of strata. As mentioned, the comparison will broadly be among customary farmers, those on State land with titles, and those on State land without titles, which comes to three strata. The target sample size overall is therefore three times 82, or 246.

Note that this formula yields a sample size suitable for the restricted, exemplary purpose of testing difference in proportions among strata. Naturally, in the course of analysis, other tests,

variables, and stratifications will emerge. The choice of sample size thus embodies a broad simplification. Nonetheless, since the choices of the discretionary values of z and d stay on the side of caution, it may be confidently expected that the resulting sample size will be sufficient for the various purposes planned.

RESPONSE RATE: As the PHS part of the sample represented the customary stratum, the ideal sample size required a target of 82 households. Anticipating a certain non-response rate, this implied covering five CSAs comprising 100 households (because the PHS sample contained 20 households per CSA). Of these, the interviews obtained came to precisely 82 in the end. The decision was made in the field to interview a further 21 customary households in one area not in the PHS sample, Mwanachingwala (Mazabuka district). This was because of the interesting peculiarities of that zone, where a ‘village settlement scheme’ was interspersed with customary households (as described above in Section 3.3.3.8), promising good comparability. As no updated sample frame was available for that zone (being outside the PHS), those households were selected by the same traverse method applied to settlements generally (and to the settlement part of Mwanachingwala, where a similar number of interviews were obtained).

In addition to the 103 customary households interviewed, a total of 163 households on State land were interviewed. This was nearly equal to the original target of 82 for each of the two State strata.

SUBSTITUTION: For the PHS part of the sample, if a household had no suitable respondent at the time of visit, it was re-visited once or twice on subsequent days; if it still was unable to respond, it was dropped without substitution. If the HHH had changed since the PHS, the new HHH was interviewed. For the settlements, non-responding houses (those with no suitable respondent at home at time of visit) were dropped, and the (geographically) next household with suitable respondent was substituted.

4.4.5 Units of Analysis

The unit of analysis is the household. The definition used in Zambia’s Post-Harvest Surveys, being tested and culturally appropriate, was adopted (and explained to the enumerators):

“A household consists of a group of person related by blood, marriage, or adoption, including other persons, such as house-hold help or farm laborers, if any, who normally live together in one house or closely related premises and take their meals from the same kitchen. This group of persons look at one person whom they regard as the head of the household. It may also consist of one member.

“The household is our unit of enumeration and interviewers have to be clear about what constitutes a household. A household is not necessarily a family. Interviewers

have to look at the structure and be satisfied that this group of persons live together and eat together from the same kitchen. Some respondents have pride in showing how large their families are and will include persons who do not live there as members of the household.” (Zambia, 2001: 21)

Some of the problems of using the household as a unit of analysis, with implicit assumptions of clear delineations between households, unitary intra-household interests, and an uncontested ‘head of household,’ were reviewed in Section 2.16. Households in SSA may be units of production, but usually not of a unitary kind in the sense of having common interests and utility-maximising functions, because of internal divisions of property, labour and income (and their attendant inequalities, most importantly between the genders). Subdividing the household might therefore sharpen the analysis on the elements of land tenure and its effects on individual welfare outcomes. A further problem with privileging the putative unitary household in the analysis is that it risks overlooking how households as units of production are affected by their relations with other households – especially non-commoditised relations, for example of mutuality (as manifested in social mechanisms for sharing land, harvest labour, inputs, etc.), or of social differentiation (possible domination of poorer/weaker by richer/stronger households, likely resulting in unequal exchange or access to scarce resources).⁷¹ Any single choice of a unit of analysis is a limitation: in the context of Southern Province as with many others in sub-Saharan Africa, other units of analysis (both larger and smaller than the household) may illuminate land issues. Moreover, the possibility must be conceded that unmeasured phenomena related to such other units (sub- or intra-household, cluster, community, etc.) may potentially confound findings on household-level phenomena. On the other hand, the cultural context of the study area, where many farming rights, obligations and activities are organised and understood at least partially on household lines, does provide a certain rationale for the choice of the ‘household’ as a unit of analysis for testing the micro-economic incentives and opportunities of land tenure. The limitation of treating the household as internally unitary and unaffected by external social relations (either mutual or unequal) – thus conceiving a unit of analysis that is no less problematic than any other choice – is to be borne in mind when assessing the results.⁷²

Interviewees were the head of household (self-identified),⁷³ or, in her/his absence, any adult resident capable of answering most questionnaire items. Households with no such suitable

⁷¹ Although, as mentioned in Section 4.3, some of the possible manifestations of inter-household resource flows such as borrowing animal traction are measured and analysed in this study.

⁷² A further reason for adopting uncritically the household (as defined for the Post-Harvest Surveys) as the unit of analysis was practical: as described in Section 4.4.4, this study took advantage of the sample used in the latest Post-Harvest Survey to re-visit those ‘households’ in the selected customary-land zones.

⁷³ “The head of the household is a person who is considered to be the head by members of the household. The husband, in a matrimonial household is usually taken as the head of the household. In

respondent were bypassed if part of the settlement stratum, or re-visited on the customary-land stratum where HH selection was pre-determined by the PHS sample. With a few such households, re-visiting was infeasible, and these were dropped from the sample.

4.4.6 Key Informant Interviews

Interviews were conducted with the following key informants:

A. District Agricultural Officers

- Former Monze District Agricultural Officer
- Mazabuka District Senior Agricultural Officer, Women & Youth Extension Project Officer, and Irrigation and Land Use Officer
- Monze District Senior Agricultural Officer, Land Use Officer

B. Settlement Chairmen / Agricultural Officers

- Silwiili Settlement Agricultural Officer
- Kayuni East Settlement Chairman
- Namilongwe Settlement Chairman

C. Bank Loan Officers

- Loan Officer, Zambia National Commercial Bank, Monze.
- Loan Officer, Zambia National Commercial Bank, Mazabuka.
- Loan Officer, Barclays Bank, Mazabuka.

D. Customary Leaders

- Chief Mwanachingwala, Mazabuka District

E. Aid agencies / donors involved in Land and/or Agriculture

- Co-ordinator, Law & Development Association (LADA), Monze.
- Lending Officers, Credit Management Services, Monze.
- Programme Officer, Credit Management Services, Lusaka.
- Country Director, CARE-Zambia, Lusaka
- Agricultural Officer, USAID-Zambia
- Executive Director, Zambia Agribusiness Technical Assistance Center (ZATAC)
- Country Director, FAO-Zambia

his absence it is the wife or the eldest member of the household who assumes responsibility of head of household.” (Zambia, 2001: 22)

F. Researchers on Land and Agriculture

- Economist, Zambia National Farmers' Union
- Co-ordinator, Food Security Research Project, Lusaka
- Professor, University of Zambia School of Agricultural Sciences

G. National Government Officials involved in Land and Settlements

- Registrar, Lands Tribunal, Lusaka.
- Acting Surveyor-General, Ministry of Lands, Lusaka.
- Chief Lands Officer, Ministry of Lands, Lusaka
- Chief Planner, Department of Resettlement, Office of the Vice-President, Lusaka

The interview formats varied with each, as their various roles suggest; those with bank officials for example focused on credit supply for small farmers, while those with agricultural officers focused on agronomy and policy. In all cases the interviews were open-ended, with informants free to dismiss the relevance of the line of questioning if they wished, and substitute their preferred topic.

Part of the questionnaire was also devoted to gathering key-informant-type information from survey respondents: many questions were open-ended, elaborations and clarifications were recorded, and additional comments were encouraged. Indeed many respondents were voluble, some stressing the importance of land tenure, others dismissing its importance compared to that of input supply, credit, livestock etc.

4.5 Fieldwork

4.5.1 Selection and Training of Enumerators

Enumerators were identified through collaboration with the University of Zambia School of Agricultural Sciences. Faculty prepared a list of recent baccalaureate graduates who came from Southern Province and spoke Tonga as their first language. A shortlist was made following examination of their *curricula vitae*. The author interviewed twelve shortlisted candidates, including a mock survey interview (in English). Five enumerators were thereby selected on the basis of performance in the interview (precision in questioning and recording responses, and interviewing manner), academic record, and references. They were hired under terms including expenses and a modest lump-sum payment upon completion of surveying of the target sample.

Three days of training were held in Lusaka, with a further two days on site in Southern Province. Training covered: basic sampling theory and this study's specific sampling method; general interviewing procedures and specific data collection procedures (drawing on the PHS Interviewers Instruction Manual [Zambia, 2001]); land tenure issues generally; and the specific hypotheses and context of this study. The training included practice interviews, first with households in rural Lusaka province, then in Monze district, in the presence of the author.

4.5.2 Management of Fieldwork; Quality Control

The author was in the field with the enumerators on most interviewing days, to ensure correct household selection and good-quality data collection. Transport was by hired 4x4 and motorbike. The author reviewed all completed questionnaires, mostly within 24 hours of interview, and thus was able to clarify contradictory or incomplete information with the enumerator while memories were still fresh. In the occasional event of unresolved contradictions or omissions, the enumerators were sent back to the same household to fill the gaps.

4.5.3 Duration of Interviews

Interviews lasted about 90 minutes in the first two weeks, declining to 60-75 minutes as interviews became increasingly proficient. It was observed that respondents became fatigued or impatient around the one-hour mark, but none refused to complete the interview.

The survey fieldwork was completed in about four weeks.

4.5.4 Problems During Fieldwork

The length of each interview (60-90 minutes) was a concern in that respondent fatigue or impatience might reduce the quality of information; but this was felt to be necessary to collect the breadth of information per household that the study design required. At any rate, as mentioned, no respondent households refused to proceed or became non-responsive.

The PHS part of the sample involved finding individual households using the HHH's name and the house number from the 1990 census. This was tedious but eventually possible in all cases; however, as noted, 18 out of a targeted 100 households had no suitable respondent at home during repeated visits, and had to be dropped. Similarly, non-PHS (i.e. settlement) households with no suitable respondent were dropped, thus potentially introducing a bias against those with reason to be away from home, e.g. seasonal off-farm employment.

A more general potential bias, particularly salient in land issues, arises from the fact that the whole sample consisted of households currently engaged in farming. If poor tenure security

had resulted in a population of dispossessed ex-farmers, for example living in towns, this sampling method would not reach them. The study design therefore had an innate and automatic bias towards those with the minimal tenure security of currently occupying farmland. (Previous studies reviewed in Chapters 2 and 3 had the same bias.)

A more specific bias, though one whose direction is hard to predict, stems from the sampling method. Strictly speaking, the sample universe is only those areas from which households were selected: the five CSAs and the selected settlements (plus the extra customary cases in Mwanachingwala). While the implicit aim of the study is to generalise about Monze and Mazabuka districts at a minimum, with arguable application to Southern Province, Zambia, and the southern African region, the sampling method of this relatively small-scale (though detailed) study allows generalisation with statistical confidence only within the actual sampled population. However, as mentioned, it is highly unlikely that findings generated from this sample are at odds with the reality of broader similar populations.

4.5.5 Seasonality Factors

The fieldwork was conducted in July 2001. The farming season in Southern Province starts in October (when rains, ploughing and planting occur) and runs through April/May (harvest). The fieldwork was therefore scheduled to avoid the farming season when respondents were likely to be in the fields during daylight or otherwise have less time for interview. (Access to remoter homesteads by road and foot was also easier, as it was the height of the dry season.) There was a risk of bias in that households whose heads had dry-season off-farm employment opportunities would be dropped for lack of suitable respondent; however this had to be balanced against the risk of bias against those working the fields during the growing season.

Not all respondents households had sold their maize harvest at the time of survey (about two months after harvest). The questionnaire did not specify whether they intended to sell, as opposed to using for subsistence only. It was evident that there was a financial advantage to delaying sale until after the peak selling season at harvest time, when the market is glutted and prices are lowest. Growers who could afford to wait could expect a better price a few months later, though some growers seemed to need the cash immediately. (For purposes of calculating household income, all harvested maize was valued, whether sold or not.)

4.6 Analysis

4.6.1 Software

Data were entered, cleaned and analysed on SPSS (v.10). The author did all data entry and cleaning.

4.6.2 Statistics

The statistical methods used in analysis ranged from the simple (means, medians, cross-tabulations) to the somewhat more complex (linear regression, Tobit regression). Following is a brief discussion of the decisions behind the use of these techniques.

Many of the key variables (such as fixed investments) turned out to have non-normal distributions, rather than normal distributions in which the majority of cases fall near a central tendency. For example, with fixed investments, a significant minority had zero; a large plurality were in the near-zero range; and some values rose to high extremes. For such distributions, the arithmetic mean is a misleading summary of the data, as it is skewed by high or low extremes. The median is the preferred statistic in such cases; so in comparing tendencies between groups (e.g. fixed investments between State and customary-land farmers), where a means-based significance test such as the *t*-test would normally be used, a non-parametric ‘median test’ is used instead.⁷⁴ The advantage of median tests is that they are much more reliable in the presence of extremes (being unaffected by high extremes or zero values) and so require less stringent assumptions than parametric tests; the disadvantage is that they are weaker, less likely to identify an existing significant difference. For polarised distributions with no central tendency (e.g. having abundant zero-value cases plus some high extremes), use of the median will be supplemented by separate examination of certain ranges (quintiles).

Regression was necessary to control for socio-economic factors that may confound the effects of land tenure (as diagrammed above in Figure 4.3). Linear ordinary-least-squares (OLS) regression requires a normal distribution of residuals, which usually implies the need for a normally-distributed dependent variable. The raw data for some variables (e.g. productivity) were therefore not suitable, but could be made so through mathematical transformations, as detailed with the regression results in Chapters 5 and 6 below. For other variables (such as aggregate fixed investment), large clusters of cases at the low end of the range made the distribution not amenable to mathematical transformation towards normality. However, to the extent that they constitute a censored distribution, they are suitable for Tobit regression.

Both forms of regression need their results to be examined for robustness to extremes, i.e. confirming that the results hold if cases with extreme values in certain variables are excluded. For example, if farm size were found to have a significant association with fixed investments, but there occur cases of extreme farm size (e.g. over 150 hectares, compared to a median of

⁷⁴ The ‘Median Test’ tests whether groups are from populations with the same median with respect to the test variable. A significant finding indicates high probability that they are from populations with different medians.

perhaps 2 ha), it would necessary to regress again with the cases of extreme values excluded. If the significance, direction, or magnitude of the coefficient for farm size (or other variables) thereby changes, then the association is not robust to extremes. Where to draw the line of exclusion in such cases is more art than science: “extreme” could be defined mathematically (e.g. greater than three standard deviations), but it is usually best to examine a scatterplot and see which cases above which magnitude seem to be outliers. For those variables whose distributions extend to outliers or extreme values, exponential transformations to reduce their range (such as taking the square root or natural log) are an acceptable procedure.

Standard procedure requires full regression outputs to be presented, including residual plots and scatterplots of all bivariate combinations. This becomes tedious with more than a few variables, in that the substantive results are interrupted by multiple pages of extraneous plots. So the practice in this study will be to present in the main section only those plots that turn out to be significant or otherwise of interest. Full regression outputs appear in Annex 2.

4.6.3 Description of the Variables

Most of the key variables were introduced in Section 4.3 above, in the course of describing their place in the conceptual framework.

Some key variables in the analysis had to be derived or composed from raw questionnaire data. Obviously, consistent data would not have been obtained from asking “What is your household income?” or “What is the total value of your fixed investments?” Variables such as aggregate fixed investments and household income would have to be derived from discrete questionnaire items, such as crop sales or number of wells. Such derived values may not necessarily be comparable to those of subjects outside the study—household income, for example, is only comparable if calculated by an identical method. But the guiding principle was that such derivations must be internally consistent, so that the derived values would be comparable to other cases within the study.

The following variables were derived through composition, aggregation or other process:

1. Aggregate cost of fixed investments
2. Point-scoring system for fixed investments
3. HH income
4. HH labour force
5. HHH’s children’s educational attainment
6. Distance to Market
7. Index of HHH’s parents’ endowment

Following are brief explanations of the derivation of each, with fuller details in Annex 1.

4.6.3.1 *Aggregate cost of fixed investments*

In the dataset, many data on the cost of fixed investments are missing: predictably, in the majority of cases, respondents did not know or could not recall. As a result there are large gaps in the data on values of fixed investments, and we risk losing significant data if we drop non-cost-reporting respondents from the analysis. We therefore attempt to use the cost reports that do exist to derive an average value for each common type of fixed investment, so as to assign these values to those respondents who did not report costs.

Previous studies in sub-Saharan Africa have tested the effects of different categories of land tenure (as an independent variable) on the occurrence or frequency of single types of fixed investment (wells, organic soil treatment, tree planting etc.). The obvious shortcoming of this method is that, by taking each type singly, it fails to accurately measure the level of fixed investment of a farmer who has installed more than one type. Some studies try to avoid this by grouping investment types together and then treating them as a binary variable, e.g. ‘any earthworks,’ ‘any waterworks,’ as in Place *et al.* (1995: 163). This is also less than satisfactory, as the binary treatment does not differentiate between someone who makes the minor investment of, say, terracing a small garden and someone who installs a major earthen dam. Binary variables are also less likely to be shown to relate to continuous variables. A method is needed to derive an aggregate value or score on a continuous scale for each respondent’s fixed investments taken together. This would allow comparison between, say, a respondent who has three wells and a concrete house and one who has fifty fruit trees and a borehole.

Normally in economic analysis, values for such investments would be obtained, if not directly from respondents, then indirectly by calculating from “background data” like prevailing market prices for inputs, labour etc. However in this study area, high inflation and market imperfections make such background data unstable, and any derivations therefrom impeachable. To estimate the value of, for instance, a well entirely from background data, one would have to obtain the cost of materials (such as cement) and of labour, estimate the average amount of labour input needed per well, and thereby assign a value. The resulting value would be highly sensitive to the multiple assumptions in the estimation process, making the whole process of poor reliability.

However, for every major type of fixed investment in this dataset, a certain percentage of observations were accompanied by reported costs. These reports can form the basis of a

derivation of a typical cost for each type of fixed investment, which can then be assigned to the respondents who were unable to report cost. In this way, every respondent who made a fixed investment receives proper “credit” for it in the analysis of levels of fixed investment with respect to land tenure; and crucially, respondents with different types of fixed investment can be compared.

Table 4.1 shows the proportion for each type of fixed investment of occurrences that came with cost observations:

Table 4.1: Number of cost observations for each type of investment

Investment type	Number of cost observations	Number of occurrences	% of occurrences with cost observations
Terracing	1	4	0.25
Well	45	98	0.46
Drainage	3	16	0.19
Fencing	25	53	0.47
Tree (windbreak)	15	57	0.26
Tree (crop)	28	169	0.17
Dam	9	14	0.64
Borehole	8	11	0.73
Concrete house	26	56	0.46
Burnt brick house	55	103	0.53

With only one cost observation for terracing and three for drainage, no reliable typical cost can be derived for assignment (especially as these installations require only labour and no purchased inputs); therefore they will not be costed and will not go towards a household’s aggregated fixed investment by cost. Tree planting (both windbreak and crop trees) also has a low percentage of observations, but a higher number of observations; so it is possible to derive a typical cost.

The approach to calculating costs for assignment is:

1. Convert reported costs to unit costs by dividing by the quantity of each investment (e.g. per well, per tree, or per meter of fencing).

2. Convert reported unit costs into constant kwacha terms using the CPI series in which 1995 = 100.⁷⁵ (Data were collected on what year the improvements were constructed and paid for, allowing the use of this deflator.)
3. After examining the sub-sample of reported (constant) unit costs, eliminate extreme values that are clearly implausible and therefore probably the result of faulty recall.
4. From the remainder, choose the statistic (mean, median, or mode) that most closely reflects the dataset and is conservative in its valuation.

Essentially, this is a ‘naïve’ or ‘zero-order’ approach that “replaces missing values by mean values of the variables.” (Anderson, 1983: 450) However we note that the crucial variable is whether a respondent has a certain investment—and this is not imputed but reported. A debate about how much cost to assign to it is really a debate about measurement scales. This exercise of cost estimates amounts to deriving a measurement scale based on evidence of relative values.

Perhaps this process should be cautiously termed ‘imputation.’ However, according to Gittinger, to impute is “To determine a price or economic value by some computation rather than by using an observed market price.” (Gittinger, 1982: 477) Our procedure is therefore not strictly imputation: it is applying an observed (mean) market price (or cost, more precisely) to transactions (investments) whose costs were unreported.

In all analyses, the quantities of fixed investments exclude those for which the household did not pay (i.e. gifts, or found on the property when acquired), because the analysis concerns households’ investment behaviour.⁷⁶ Respondents were asked to specify how an improvement was paid for, thus revealing gifts or finds, for example if a household occupies part of a settlement parcel for which a relative holds title and uses a well which the title-holder installed. Similarly it excludes improvements installed before 1975, because the purpose is to model investment behaviour relative to land tenure security, and the tenure situation changed abruptly in 1975 with the Conversion of Titles Act (see above, Ch. 3).

Details for the derivation of typical costs for each type of investment appear in Annex A-1.1.

⁷⁵ CPI data are from Virtual Zambia (Biz/ed, 2002) for the years 1973-1998, and from the World Bank (2001) for 1999-2000. The two series are compatible.

⁷⁶ This is imperfect in cases where the respondent purchased the parcel and presumably included unexhausted improvements in the purchase price; this would form part of the purchaser’s investment behaviour. However land acquisition by purchase was rare in the sample, so this imperfection is disregarded.

4.6.3.2 *Point-scoring system for fixed investments*

Because the aggregate cost data embody some estimates alongside reported costs, it will be wise to double-check with an alternative system of aggregation. A point-scoring system is therefore devised wherein each type of fixed investment is assigned a point value (between one and four points), based on common-sense equivalencies (e.g. one well is deemed to be worth as many points as 200 meters of drainage ditch). The points for each type and quantity of a household's investments can then be summed into an investment point score for the household.

The point system is detailed in Annex A-1.2.

4.6.3.3 *Household income*

Measuring household income is nearly a social science in itself. This study does not claim to measure it according to the most advanced definitions, or in order to produce a figure that would be comparable across regions or countries (e.g. purchasing-power parity). The aim is to use a method of calculation that is internally consistent, so that households within the sample can be compared. The method should also be substantively sensible, not excluding any obvious or major production costs or non-cropping income.

Household incomes (for the 12 months preceding the survey, thus starting July 2000) were calculated by adding all reported revenues (crop and vegetable sales for the recent harvest plus valuation of unsold crops; livestock revenues; and other reported income) and subtracting field crop costs (seed and fertiliser purchases, hired labour, hired animal traction, and credit charges). Data were recorded and are presented in nominal 2001 kwacha (unlike aggregate investment by cost which is presented in constant 1995 kwacha). Details appear in Annex A-1.3.

4.6.3.4 *Household labour force*

Labour force is defined for this study as all household residents from the ages of 12 to 64 years. For purposes of calculating labour productivity of field cropping, hired labour is added (pro-rating person-days worked, on the basis of a 260-day working year, equating to five days per week).

For the handful of cases (3) with no HH residents between 12 and 64 (e.g. elderly widows looking after a few grandchildren), a non-zero value must be assigned for HH labour force, lest the labour productivity be calculated as infinite. A value equal to one-half of the total of HH residents outside the ages of 12-to-64 is therefore assigned (reflecting the lesser physical capacity of people at extremes of age).

For the five missing values (where respondents could not provide the information), it is preferable to assign a plausible value, lest these cases be excluded from regressions. Where corroborating information can be gleaned from the interview (e.g. number of HHH's children who have graduated from school, etc.), that information is used to impute a value for HH labour force. Where no corroborating information can be gleaned, the mean will be substituted.⁷⁷

4.6.3.5 *HHH's children's educational attainment*

The purpose of these data are to assess whether offspring of households in any particular tenure category have a different educational trajectory than the others. Two sets of variables were derived: the first reflecting completion rates for specific marker grades (7th, 9th, and 12th) relative to the appropriate ages for those grades; and the second, an aggregated index for the three marker grades together. Cases whose children were all too young to have completed 7th grade are therefore automatically excluded from analysis. Details appear in Annex A-1.4.

4.6.3.6 *Distance to market*

This variable is an index composed of the mean of distance to point of purchase of inputs and distance to point of sale of maize. Details appear in Annex A-1.5.

4.6.3.7 *Index of HHH's parents' endowment*

The purpose of this variable is to account for any non-observed advantages conferred by or inherited from greater socio-economic status of a respondent's parents. Various relevant questions were asked, but the two that produced usable data were HHH's father's educational attainment (highest grade completed) and HHH's father's land holdings (in hectares). Since these are in different units but needed to be combined into an index, the raw data for each were converted into z-scores, then added to produce the indexed score. Details are in Annex A-1.6.

⁷⁷ Mean HH labour force for farms on State land is 7.22; for customary-land farms it is 5.14 ($t = 2.976$, $p < 0.01$). The mean substituted to missing cases is therefore the mean for that farm's land category.

Chapter 5: RESULTS: TENURE SECURITY AND FIXED INVESTMENTS

5.1 Introduction

5.1.1 Profile of Sampled Households

A brief socio-economic profile of the sample follows, to contextualise the main analyses. 163 of the sampled households are on State land, 103 on customary land. Among households on State land, 35% have titles, 38% have 14-year leases, and the remainder have no document. (Some of those who reported having titles or leases clarified that the title is actually in the name of a relative who invited them onto a part of the land.⁷⁸) Therefore of the overall sample, 125 (or 48%) have some sort of land document, and 138 (52%) do not. Table 5.1 (overleaf) summarises socio-economic and farming data for each category of land documentation. Most of the farming indicators thereon are highest for the leaseholder and titleholder categories.

Other details on farming practices: Use of traction is similar between State and customary land: 89% overall used animal draught for ploughing (91% on customary, 87% on State); 4% used animals plus mechanical traction; and only 7% used neither. Regarding the source of the traction, 59% own it (52% on customary, 63% on State); 23% hired it; and 18% borrowed it (22% on customary, 15% on State). 33% of cases reported having hired temporary farm labour in the current year (22% on customary, 40% on State).

Table 5.2 (overleaf) present similar socio-economic and farming data per quintile of total crop value per household. The sample is split into crop value per household rather than per capita in order to focus on agrarian structure, of which the possible advantages of large household size may be an important aspect. Put another way, the top quintile in this division consists of the largest-producing households (which, in view of the finding shown on Table 5.2 that HH labour force increases with quintile of HH crop value, also tend to be the largest households), not necessarily the most productive.⁷⁹ Like HH labour force, most of the variables increase with quintile ranking, except proportion of female-headed households and proportion of cultivated hectareage dedicated to local maize, which decrease conspicuously. These data recall

⁷⁸ In ascertaining tenure status through interviews, enumerators generally took respondents who confidently described having 14-year leases or 99-year titles at their word. Those seeming less sure were asked to show their document, which sometimes corrected the respondent (as with one who thought he had a mere letter from the Ministry of Lands which turned out to be a lease).

⁷⁹ Productivity (output per unit input, e.g. crop value per capita), including the possible contribution of household labour force thereto, is extensively analysed in Section 6.1.

Table 5.1: General Characteristics of Sampled Households and Parcels Across Land Documentation Categories

Variable	Total	No doc, cust. land	No doc, state land	HHH's relative holds lease	HHH's relative holds title	HHH holds lease	HHH holds title
Number of HH observations (<i>n</i>)	266	103	43	22	18	42	38
Age of HHH (median)	45	45	47	32	40	47	64
HHH highest school grade completed (median)	7 th	7 th	7 th	7 th	9 th	7 th	7 th
HH labour force (HH members aged 12-64) (median)	5	4	5	3	4	6	8
Farm size (median in hectares)	6	4	7	5.75	5	20	41.5
Area cultivated 2000/01 (median in hectares)	3.2	2.4	3.8	4.0	3.6	4.5	5.8
Years since parcel acquisition (median)	13	14	15	7	7	9	22
Prevalence of key crops (mean proportion of cultivated area under each)							
Hybrid maize	.35	.32	.35	.30	.48	.34	.46
Local maize	.30	.38	.29	.30	.17	.24	.19
Cotton	.09	.07	.12	.11	.12	.12	.09
Sunflower	.06	.02	.08	.04	.07	.09	.10
% using chemical fertilizer 2000/01	54.2	40.8	61.0	54.5	55.6	70.7	65.7
Number of cattle owned (median)	0	0	0	0.5	1	5	11.5
Credit use (median total value of loans over previous 5 years, nominal 2001 kwacha)	84,600	0	20,000	115,000	166,500	355,349	200,000
HH crop value per hectare (median, nominal 2001 kwacha)		222,300	292,671	200,225	323,309	333,217	388,479
HH income per capita, 12 mo. 2000/01 (median, nominal Kw)	119,508	56,952	130,694	64,680	140,042	171,179	279,084
Land Documentation Status (% of HHs in each category)	100	38.7	16.2	8.3	6.8	15.8	14.3

Notes:

2001 nominal Kwacha: Kw 3,350 = US\$ 1.00

HH = household

HHH = head of household

Momba's finding (1989: 336-337, cited in Sec. 3.3.1.1) that unequal access to credit post-1970 drove unequal access to fertiliser and hybrid seed, and hence deepened differentiation. Here, the upper quintiles of total crop value show greater credit use, fertiliser use, and proportion of cultivated area dedicated to hybrid maize and cotton. (Whether this relation holds when total crop value is expressed on a per-capita basis and in the presence of control variables is analysed below in Section 6.1, and related to access to land in Section 6.4.) The upper quintiles also show greater HH income per capita resident, not just overall, suggesting greater productivity. (Causes of HH income per capita are explored in Section 6.5.)

Table 5.2: General Characteristics of Sampled Households and Parcels Across Quintiles of Total Household Crop Value (2000/2001 season)

Variable	Total	Lowest quintile	2 nd quintile	3 rd quintile	4 th quintile	Highest quintile
Age of HHH (median)	45	44	49	40	47	45
HHH highest school grade completed (median)	7 th	7 th	7 th	7 th	8 th	8 th
Proportion of female-headed households	0.11	0.30	0.06	0.06	0.08	0.02
HH labour force (HH members aged 12-64) (median)	5	3	4	5	5	8
Farm size (median in hectares)	6.0	3.0	4.0	7.3	8.0	19.0
Area cultivated 2000/01 (median in hectares)	3.2	1.4	2.2	3.5	4.1	8.4
Years since parcel acquisition (median)	13	10	8	12	15	21
Prevalence of key crops (mean proportion of cultivated area under each)						
Hybrid maize	0.35	0.21	0.37	0.33	0.36	0.49
Local maize	0.30	0.53	0.34	0.25	0.23	0.12
Cotton	0.09	0.01	0.03	0.09	0.14	0.19
Sunflower	0.06	0.02	0.04	0.08	0.08	0.07
% using chemical fertilizer 2000/01	54.2	19.2	51.0	51.9	67.9	82.0
Number of cattle owned (median)	0	0	0	0	3	12
Credit use (median total value of loans over previous 5 years, nominal 2001 kwacha)	84,600	0	0	141,667	200,000	533,336
Total crop value, 2000/2001 (median, nominal 2001 kwacha) ⁸⁰	836,395	129,600	430,800	836,395	1,600,500	4,328,600
HH income per capita, 12 mo. 2000/01 (median, nominal Kw)	119,508	20,000	54,960	112,319	169,929	330,615

Notes:

2001 nominal Kwacha: Kw 3,350 = US\$ 1.00

HH = household

HHH = head of household

Nearly half (14 of 29) of female-headed households are in the lowest quintile of total household crop value.

⁸⁰ Total crop value is not net of crop input costs (fertiliser, seed etc.). Total HH income is net of reported production-related costs (at the HH level); however, costs for non-field crop income (e.g. vegetables, livestock, crafts, trade) were not obtained from respondents, hence not deducted from total HH income. However, values of the two variables parallel each other in most cases.

5.1.2 Respondents' Opinions on Land Rights, Fixed Investment, and Farm Performance

Most of the results presented in this chapter and the next are quantitative. However it is wise to begin with observations and comments by respondents, to paint an initial picture of local tenure issues and respondents' perceptions thereof.⁸¹

5.1.2.1 Observations on Tenure Security and Farm Performance

Land tenure security, or putative insecurity, is not cited by most respondents as a direct constraint on agricultural performance in the study area. Neither is lack of fixed investments. Respondents were asked "What are the most important things you can do to ensure a good harvest?" and asked to name three. By far the most frequent answers were: hybrid seed (cited by 76.7%), fertiliser (82.3%), and animal traction (69.2%). Of those who cited hybrid seed, 56.9% reported being able to use it in the study year; of those who cited fertiliser, 47.2% reported being able to use it in the current year; for those who cited animal traction, 44.8% reported being able to use it.⁸²

Some respondents elaborated on the majority view regarding titles' place in the hierarchy of needs:

"We wouldn't need titles per se to develop—what we need is a deliberate policy from government to bring oxen as well as inputs on time; then we can start producing like we used to." (Interview no. 0724ah02, Hamakona customary)

"With or without a title production cannot take place on the land without animal traction, inputs or other kinds of support." (Interview no. 0725cn01, Chikakula customary)

"Farmers wish the government could make the titles cheaper because farmers are not getting enough money from sale of produce. Government should make input/s/ readily available. Government should intervene in marketing of produce—prices are too low, hence farmers have no incentive (motivation)." (Interview no. 0719cn04, Namilongwe settlement)

"The issue of getting titles from chiefs would cause a lot of difficulties. Lots of people would be left out." The respondent lost cattle to corridor disease, but also to property grabbing after father's death. Transporting produce is expensive: "Just to transport a 1x50kg bag of maize will cost you an extra K5000 ..." "We need fixed improvements like fencing and poultry houses but even with titles it is not easy to access credit. You

⁸¹ Aside from closed-ended questionnaire items that solicited opinions, respondents were invited at the end of the interview to offer any other comments; plus they were free to make comments or elaborations during the interview. Enumerators transcribed the comments (some in the first person, some in the third), simultaneously translating into English (if the respondent spoke in Tonga), usually in telegraph style. In the selections that follow, direct quotes from the enumerator's notes appear in inverted commas (with some punctuation added for clarity); other text is summary or clarification of comments, or background.

⁸² Some respondents claimed not to have been able to use hybrid seed, fertiliser, animal traction etc. this year, then reported later in the interview that they did, perhaps because of strategic responding.

have to know someone or actually bribe someone to get a loan.” “Extension officers end up being farmers; instead of doing their job to advise farmers, they end up farming. To come to your farm you need to bribe them for that. They earn double salaries.” (Interview no. 0718ah01, Namilongwe settlement) [*Respondent is cousin to head of household, who holds lease.*]⁸³

5.1.2.2 *Desire for Title*

Asked if they wanted to change anything about their tenure status, 48% of respondents on customary land responded that they wanted a title, as did 80% of those on State land who didn't already have one. Asked why they wanted a title, 80% cited avoiding risk of dispossession (including 76% of customary-land respondents and 83% of State-land respondents); 45% cited protecting fixed investments (31% of customary, 52% of State); 27% cited ensuring bequeathment (40% of customary, 21% of State); and only 7% cited using land as collateral or getting better access to credit (9% of customary, 6% of State).⁸⁴ So there is a degree of perceived tenure insecurity, though more so on State land than customary. Titles are seen as a remedy for insecurity, but there is a resounding lack of interest in mortgaging land.

Some respondents registered strong opinions on the benefits of titles for security, especially from Tundwe settlement which is embroiled in a general dispute resulting from one settler's having managed to obtain a title for the entire settlement scheme:

“Title ensures security and hard work because there's no risk of someone grabbing your land.” (Interview no. 0721cn02, Tundwe settlement)

“The small farmers are seriously affected by the non-availability of titles—without titles there are conflicts about boundaries and so, it is difficult to put up improvements. —All farmers in Tundwe have no titles.” (Interview no. 0721cn04, Tundwe settlement)

“We want title deeds so that we can effectively and permanently settle and be free so that we can grow as much crops as we want to.” (0721th03, Tundwe settlement)

“The respondent emphasised the importance of title deed[s] however was quick to point out that old men would not accept them.” (0714cn04, Hamudebwe village, customary)

The Tundwe situation recalls Bruce and Dörner's point (1982: 33, cited above in Ch. 3) that the appearance of alternative tenure regimes may stimulate a sense of insecurity (or a desire to obtain the alternative) that had not existed in the absence of alternatives. Such stimulation would be particularly acute, one imagines, if a neighbour produces a title for the whole neighbourhood.

⁸³ One respondent commented on research's place in the hierarchy of needs: “Why are we constantly being researched. What is the purpose of these visits.” (Interview no. 0712ah01, Hamayanda customary.)

⁸⁴ Respondents could cite up two reasons, hence the percentages sum to more than 100.

5.1.2.3 *Observations from customary land holders on titles*

The respondent in interview no. 0714cn04 (cited above) seems to be right about old men not accepting titles. On customary land, respecting the question “Do you want to change anything about your tenure status?” (to which nearly all affirmative respondents went on to say they wanted a title), the mean age of ‘yes’ respondents (i.e. those who wanted a title) is 42.9 years, vs. 52.2 years for the ‘no’ respondents. (The medians are similar to the means.) The *t*-test for this difference in means is significant ($n = 94$, $t = 2.895$, $df = 92$, $p < 0.01$). So on customary land, titles seem to be more acceptable to, or more sought by, the younger cohort.

Some customary-land respondents described a clearly familial nature of land ownership:

“I can never agree to be moved; you [*would*] have to kill me...We have deliberately decided not to touch the issue of titles because this is ancestral land. However if you are coming to warn us that you will get our land then tell us. We can not get individual titles because it can mean that we are being choosy i.e. we will be splitting the clan.” (Interview no. 0707ah01)

“I can’t get titles on my land because this is traditional land. My ancestors left this land for me and brothers and sisters and to do otherwise I would be denying my relations their rights to this land.” The respondent explained that he can bequeath the land to a son, but to his daughter “only if she is single and living in my house.” (Interview no. 0709th01)

Regarding the relative importance of certain land rights, “I don’t [*want*] the other rights [*to sell and to mortgage*] because if I buy land it would be for my whole family and if I sold the land I would be denying them land.” (Interview no. 0711th01)

Others raised the issue of envy with respect to individualisation of land rights:

“[I] Would be bewitched if I got a title deed on this land unless I moved to the settlement area.” (Interview no. 0709ah02) (Respondent is single female HHH.)

“The issue of titles will not work in this village. Land here is collectively owned and can’t be claimed by any one person.” Cites “lots of witchcraft” answering whether others would be jealous if he installed a lot of land improvements. (Interview no. 0711ah01) (Respondent is headman’s son.)

Aversion to titles seems, on the basis of these remarks, to stem from regard for the feelings of others and for social systems (especially kinship), rather than any sense that titling would be individually disadvantageous.

5.1.2.4 *Which Land Rights Are Most Important to Respondents*

The basis for the desire for titles becomes clearer in responses about the importance of specific land rights. Respondents were asked to designate the relative importance of each of the following land rights (by arranging cards on which the rights were depicted): (1) ‘title’; (2) ‘right to sell the land to anybody’; (3) ‘right to use the land as collateral for credit’; (4) ‘right to

bequeath the land to your children’; (5) ‘right to cultivate the land as long as you want’ (durable usufruct); (6) ‘right to install fixed improvements like fencing or trees.’ The resulting arrangements produce the following ranking (Friedman Test), in which lower ‘mean rank’ scores indicate greater preference (Table 5.3):

Table 5.3: Ranking of Relative Importance of Specific Land Rights

Right	Mean rank
Title	1.81
Right to bequeath	2.76
Right to install fixed investments	3.02
Durable usufruct rights	3.07
Right to mortgage	4.92
Right to sell	5.43

The outcome shows a strong feeling that title is the most important right, followed by right to bequeath, right to install fixed improvements, and usufruct rights. (The fourth-place finish for this seemingly basic and important right may actually mean that respondents could not imagine or see the point of occupying land without usufruct rights.) Right to use land as collateral for credit and right to sell land were resoundingly considered the least important. A title, in legal terms, contains all of the other five rights⁸⁵; so these results can be understood as clarifying why people want titles, and also what is likely to happen if and when a majority obtains them: bequeathment and fixed investments, but not mortgaging or active land sale markets.

Friedman’s test (the appropriate significance test for this kind of within-subject ranking) is highly significant (chi-square = 677.565, df = 5, $p < 0.01$), meaning that the distinctions in relative ranking among the items (i.e. the ‘popularity’ of each) are sharp enough to be generalisable. The rankings differ somewhat between respondents on State and customary land. Among the customary-land respondents, usufruct rights are voted most important, followed by right to bequeath, title, and fixed investments. Among State land households the order is: title, fixed investments, bequeathment, and usufruct rights. (All results $p < 0.01$.) In both tenure situations however, selling and mortgaging come last. Already then, the respondents prefer not to activate two of the three postulated mechanisms by which tenure security may increase productivity (increased credit supply and efficient land markets).

⁸⁵ As indeed was pointed out by respondent no. 0716th01, though the practicality of selling even titled land was not established at the time of study since the 1995 Lands Act that allows it was not yet implemented.

5.1.2.5 *Opinions on titles, security, and fixed investment*

As a prelude to the following section in which the question of whether tenure affects investment is statistically tested, do respondents' opinions suggest that this line of inquiry is worthwhile? Comments show that some at least are well aware of the issue:

"A lack of titles inhibits (retards) development because there is no motivation to put up fixed improvements." (Interview no. 0727cn02, Mwanachingwala customary land)

"Farmers feel title deeds should be quickly given so that they can invest in their land with confidence that they will keep their parcels. Farmers would like loans in other forms e.g. cash (not just fertiliser)." (Interview no. 0719cn02, Namilongwe settlement, State land)

"The government should help farmer[s] acquire title deeds so that they can feel secure and put fixed investment." (Interview no. 0723cn03, Mwanachingwala settlement, State land)

"A lack of title has retarded development (putting up of fixed investments)... With title you can access loans by using it as security." (Interview no. 0721cn01, Tundwe settlement, State land)

"We are living on land near the road thus we are not secure enough to put a lot of fixed improvements." (Interview no. 0714ah03, Chawama; respondent is squatter on railway land.)

Apart from soliciting open-ended comments, the questionnaire asked: "When you are deciding whether to make long-term investments on the land, like planting trees or practising soil conservation, do you consider your land tenure status?" This question proved difficult to translate and generated a relatively high share of missing responses. Nonetheless 130 valid responses were recorded (49% of the whole sample). 55% of the valid responses were in the affirmative, that they do take tenure status into account when considering fixed investments. Part of the sample was asked the similar question 'Does your lack of title discourage you from making fixed investments on this land?' (If the respondent household had a title, the question was phrased as 'Would the lack of title discourage you?') Twenty cases (42%) responded 'yes' and 28 (58%) responded 'no' ($t[47] = 22.018, p < 0.01$). Cross-tabulating these responses with whether the respondent is on State or customary land shows that responses from households on State land were evenly split (16 yes, 16 no), whereas on customary land 75% (12/16) responded 'no.' So half of those on State land and a quarter of those on customary land specifically reported lack of title to be a discouragement from making fixed investments, and more than half of the overall sample affirmed the more general question that tenure status is a consideration vis-à-vis fixed investments. The analysis as to whether tenure affects fixed investment would therefore seem to be very worthwhile.

5.1.2.6 *Conclusions on Respondents' Opinions on Land Rights*

Opinions on the importance of titles for farm development range from pronouncements of irrelevance (compared to the importance of input and output markets) to affirmations of tenure security's effect on farmers' incentives. Desire for titles was widespread, even on customary land, but mainly for defensive tenure security (including securing bequeathment), and to some extent for protecting fixed investments. Kinship-based land tenure, incompatible with individual titles, is reported by some. Prioritisation of specific rights differs between State and customary, with the former prioritising title and fixed investments, and the latter voting for usufruct and bequeathment rights; however both are averse to land sales or mortgaging. Some respondents specifically observed that titles create incentives for fixed investment (and lack thereof constitutes a disincentive). For a major part of the sample, then, tenure issues are indeed relevant.

5.2 Effects of Tenure Security on Fixed Investments

This section analyses whether greater tenure security causes, or at least is associated with, greater fixed investments.⁸⁶ As both tenure security and fixed investments are malleable concepts, several complementary measures will be used for each. Generally, levels of fixed investment will be tested across different land tenure categorisations (putatively representing different levels of duration, breadth, and assurance of land rights), with control variables added to confirm whether any variations are attributable to or associated directly with tenure.

'Fixed investments' includes such improvements as wells, fencing, crop trees, or improved houses. Fixed investment is measured variously: first, raw quantities of each type alone; second, aggregate value of all of a household's types of fixed investments; third, a point-scoring system that also aggregates different types of investments but is meant as a double-check on aggregate values (because the latter may be vulnerable to distortion from historical inflation). (Details on the derivation of these indices were described in Ch. 4, Section 4.6.3.)

The factor of interest is, most generally, land tenure status, iterated in different ways: 'State or customary land,' 'Degree of secure documentation' (e.g. title, lease, or other), 'mode of acquisition,' and 'perceived tenure security.'

⁸⁶ Some studies refer to 'land improvements'; however the more general term 'fixed investments' is preferable because these data include non-agricultural improvements such as concrete houses.

5.2.1 Profile of Fixed Investments per Household

To introduce the types and quantities of fixed investments in the sample, a profile of accumulated investments per household is presented (Table 5.4), splitting the sample into quintiles of total investment (aggregated by cost). With these quintiles, the mean and median amounts of each type of investment are shown so as to illustrate a typical household bundle of investments for each level. This is not any sort of causal analysis, merely descriptive.

Table 5.4: Means and Medians of Amounts per Investment Type over Quintiles of Aggregate Investment

		QUINTILES of Aggregate Fixed Investment				
		1	2	3	4	5
<i>n</i> =		52	54	54	53	53
Wells	<i>Mean</i>	0.00	0.09	0.50	0.53	0.74
	<i>Median</i>	0	0	0	0	1
Drainage (meters)	<i>Mean</i>	11.17	5.56	9.26	36.42	64.15
	<i>Median</i>	0	0	0	0	0
Fencing (meters)	<i>Mean</i>	0.00	0.00	25.46	348.32	1236.53
	<i>Median</i>	0	0	0	0	150
Trees (windbreak)	<i>Mean</i>	0.65	1.06	2.81	2.53	2.51
	<i>Median</i>	0	0	0	0	0
Trees (crop)	<i>Mean</i>	0.44	9.39	6.89	78.74	26.43
	<i>Median</i>	0	6	1	4	7
Boreholes	<i>Mean</i>	0.00	0.00	0.00	0.00	0.17
	<i>Median</i>	0	0	0	0	0
Pot-holing	<i>Mean</i>	0.30	0.13	0.12	0.72	0.40
	<i>Median</i>	0	0	0	0	0
Concrete houses	<i>Mean</i>	0.00	0.09	0.04	0.42	1.42
	<i>Median</i>	0	0	0	0	1
Burnt-brick houses	<i>Mean</i>	0.00	0.44	0.69	1.09	1.40
	<i>Median</i>	0	0	0.5*	1	0
Dams	<i>Mean</i>	0.00	0.00	0.00	0.00	0.21
	<i>Median</i>	0	0	0	0	0

(Standard errors not presented, for clarity)

*This fractional value was produced as the median by SPSS because exactly half of the sub-sample had values of zero (obviously, no half-houses were recorded).

Taking the first type of improvement, wells, and starting with the middle quintile for convenience, we see that for the households in the third quintile (i.e. having a mid-range value of aggregate fixed investment), the mean number of wells for such households is 0.50, implying that households in that quintile are evenly likely to have one or zero wells. The median is zero, meaning that a majority in the quintile have no well. Moving to the fifth (highest) quintile, the mean is 0.74 and the median is 1, meaning that most households in that quintile have at least one well. In the first quintile, the mean and median of zero signifies that not a single household in the quintile has a well.

Crop trees, a more common improvement, start with a mean of 0.44 and median of zero in the first quintile, and proceed (though not regularly) to a mean of 26.43 and median of 7 in the fifth quintile. Other types increase smoothly, with increasing means and medians from the

first to the fifth quintiles: burnt-brick houses, concrete houses (except for one reversal between the second and third quintiles), and fencing. The means of some types (pot-holing, windbreak trees) do not increase linearly across the quintiles, and seem more random.

Major, expensive improvements like boreholes and dams only appear in the fifth quintile (and are largely responsible for putting those households into the top quintile).

In sum, an average household in the lowest quintile of aggregate investment would have: no well, eleven meters of drainage ditch, no fencing, about one planted tree, 0.30 ha of pot-holed field, no concrete or burnt-brick house, no borehole, and no dam. A household in the middle quintile might have a well, a few meters of drainage and fencing, a few planted trees, and perhaps a burnt-brick house. The investments of the average household in the highest quintile might be composed of a well, some drainage, over a hundred meters of fencing, at least a half-dozen planted trees, at least one concrete or burnt-brick house, and (rarely) a borehole or dam.

These data therefore support a generalisation that households with high aggregate investment (measured by cost) tend to have greater quantities of nearly all types of investments, rather than extreme quantities of just one or two types (or one extremely expensive type). This can be further seen by examining the composition of the aggregate investment scores. Dividing the portion of the score contributed by one type by the total of all types yields the proportion of the score due to each type of investment. (Cost scores and point scores are both presented.) This ascertains whether a case that has, for instance, a concrete house owes much or little of its investment score to that one type. Again splitting the sample into the quintiles of total aggregate investment (measured by cost), the following table (5.5) is generated:

Table 5.5: Mean Proportion of Investment Score Contributed by Each Type of Investment, per Quintile

			QUINTILES of Aggregate Fixed Investment (cost)				
			1	2	3	4	5
Wells	<i>mean % of cost</i>		n/a	0.95	0.97	0.41	0.19
	<i>mean % of points</i>		n/a	0.64	0.69	0.26	0.17
	<i>n =</i>		0	5	26	21	30
Drainage	<i>mean % of cost</i>		0.00	0.00	0.00	0.00	0.00
	<i>mean % of points</i>		0.99	0.30	0.56	0.28	0.32
	<i>n =</i>		3	2	1	3	4
Fencing	<i>mean % of cost</i>		n/a	n/a	0.71	0.57	0.22
	<i>mean % of points</i>		n/a	n/a	0.66	0.41	0.43
	<i>n =</i>		0	0	3	16	27
Trees (crop + windbreak)	<i>mean % of cost</i>		0.71	0.50	0.01	0.02	0.03
	<i>mean % of points</i>		0.73	0.63	0.25	0.25	0.13
	<i>n =</i>		17	44	33	32	35
Boreholes	<i>mean % of cost</i>		n/a	n/a	n/a	n/a	0.78
	<i>mean % of points</i>		n/a	n/a	n/a	n/a	0.28
	<i>n =</i>		0	0	0	0	9
Pot-holing	<i>mean % of cost</i>		0.00	0.00	0.00	0.00	0.00
	<i>mean % of points</i>		0.95	0.51	0.34	0.34	0.29
	<i>n =</i>		8	5	5	5	5
Concrete houses	<i>mean % of cost</i>		n/a	0.99	0.24	0.81	0.44
	<i>mean % of points</i>		n/a	0.87	0.74	0.70	0.45
	<i>n =</i>		0	4	1	18	27
Burnt-brick houses	<i>mean % of cost</i>		n/a	0.96	0.96	0.69	0.56
	<i>mean % of points</i>		n/a	0.86	0.85	0.60	0.44
	<i>n =</i>		0	18	27	27	25
Dams	<i>mean % of cost</i>		n/a	n/a	n/a	n/a	0.61
	<i>mean % of points</i>		n/a	n/a	n/a	n/a	0.24
	<i>n =</i>		0	0	0	0	11

(Some of the *n*'s are small because the analysis excludes cases with none of that type of investment; therefore the figures should be understood as proportion of cost or points contributed by that type of investment *where it exists*. Some investments that are purely labour, like drainage, had no reported costs and therefore the proportion of aggregate cost is zero, whereas its proportion of aggregate points is positive.⁸⁷ In some cells, 'n/a' appears, because no cases of that type of investment occur in that quintile, e.g. dams in the four lower quintiles).

To interpret this table, take the common investment of planted trees. For the lowest quintile, planted trees account for 71% of the cost and 73% of the points of their aggregate investment. In the middle quintile, trees account for only 1% of cost and 25% of points; at the highest quintile, 3% and 13%. A similar pattern exists with most of the other types of investment: the

⁸⁷ However, if a respondent reported paying for such labour, the cost is counted. Opportunity cost of labour is not counted *per se*, but the point-scoring system accounts for labour.

proportions for each are higher in the lower quintiles than in the upper, meaning that for those in the low-investment quintiles, most of their investment takes the form of only one type of improvement; but in the upper quintiles, no one type of investment accounts for all or nearly all of their total. Even an extreme improvement like a borehole (the most expensive type) accounts for an average of 78% of the investment cost of those who have them, meaning that as much as they have spent on a borehole, another 22% of the total has been spent on additional improvements. (Boreholes' proportion is lower when scored by points.) For medium-expensive types like concrete or burnt-brick houses, those in the lower quintiles who have them tend to have very little else in the way of fixed investment, while those in the upper quintiles who have them also tend to have additional improvements coming to about the same cost.

5.2.1.1 Conclusions on profile of fixed investments per household

The first analysis in this section showed that those in the higher quintiles tend to have more of most types of investment. The second analysis supports an additional generalisation: that those who have achieved the higher levels of investment do so with diversification, i.e. the assembly of different types of investment, and not just with higher quantities of an individual type, or even the acquisition of one of the expensive types (dams, concrete houses, and to some extent boreholes). This generalisation allows more confidence in subsequent analyses, in that: (a) high scores are not generally being skewed by valuations of any one type of investment or by the exceptional presence of expensive types; (b) a system of aggregating different types of investment (by cost or points) is necessary to model investment behaviour, because these data show that no single type is boosting the scores of the highest quintile. The high investors tend to spread their investment around several different types, whereas low investors usually manage only one or two types (if any) in significant quantities.

5.2.2 Differences in Fixed Investments between State and Customary Land

The rest of this chapter will examine variations in amount and type of fixed investment among different land tenure categories, to see if land tenure makes a difference to farmers' investment behaviour. Of the numerous ways in which land tenure can be categorised, we start with a simple bifurcation, that of farms on State land (in settlement schemes) vs. those on customary land. To preview, it would be no surprise to find that households on State land have higher degrees of fixed investment than those on customary land. Apart from any land tenure considerations, there is the history of State settlement schemes selecting 'progressive' or 'emergent' farmers from the ranks of customary farmers, and administrative encouragement or

requirement to install improvements on settlement parcels.⁸⁸ This section therefore is intended to introduce some of the data issues regarding the variables for fixed investments, in preparation for subsequent analyses involving more sophisticated categorisations.

5.2.2.1 *Differences in Quantities of Individual Types of Investment*

The disadvantage of analysing raw quantities of fixed investments is that one cannot aggregate various kinds of investments, e.g. one well plus 400 metres of fencing. The advantage is that different patterns can be discerned for different types of investment.

WELLS: On State land, 69/163 (42.3%) have at least one well, whereas on customary land only 26/103 (25.2%) have at least one. (The median test is significant: chi-square = 8.028, $p < 0.01$.) Although the median quantity of wells is zero for both strata, a higher proportion of State households have managed to install a well.

FENCING: Fencing is both seldom installed and useful only in large quantities (e.g. 400 metres to enclose one hectare), so both strata's distributions are skewed by extremes and a preponderance of zero values. A median test shows that 44/163 (27.0%) of State-land farms were above the median, i.e. had some quantity of fencing installed, compared to 9/103 (8.7%) of customary farms (chi-squared = 13.184, $p < 0.01$). (The lowest non-zero amount of fencing was fifty meters, reported by two cases, followed by 150 meters reported by another two cases, and so on up.)

TREE PLANTING: Trees for crops and for windbreaks are combined here. Unlike wells and fencing, the medians for trees are positive: the median on State land is 8.00, and on customary land it is 1.00; that of the entire sample is 4.00. A median test shows significant difference between the two strata: on State land, 57% (93/163) are above the median, whereas on traditional land 38% (39/103) are above the median (chi-square = 9.299, $p < 0.01$). The 5% trimmed mean⁸⁹ on State land is 14.25, and on traditional land, 6.08. (No significance test is available for trimmed means.) By both trimmed means and medians, then, households on State land appear to have greater accumulations of planted trees than those on customary land, and a greater proportion of cases with positive values.

⁸⁸ 10.4% of State land respondents reported having been under a requirement to install a concrete house; 14.1% to put up fencing; 6.7% to plant trees; and 4.9% to install a well. Of those who reported these requirements, 60.6% managed to comply.

⁸⁹ "the arithmetic mean calculated when the largest 5% and the smallest 5% of the cases have been eliminated" (SPSS v10); useful for distributions with extremes.

CONCRETE HOUSES: Concrete houses are a non-agricultural improvement. Yet the neo-classical model does not suggest that tenure security creates incentives only for agricultural improvements: it should increase incentives for any desired kind of fixed investment or improvement, productive or otherwise.

Concrete houses are relatively rare: only 21.5% (35/163) of the State-land stratum have at least one concrete house, and 19.4% (20/103) of the traditional-land stratum have at least one. The median test shows no significant difference (chi-square = .162, $p = 0.687$). We note that for the previous types of improvements (wells, fencing, planted trees), which can be considered agricultural improvements, the State stratum had higher medians and a lower proportion of zero values, whereas for concrete houses, there is near-exact parity.

BURNT-BRICK HOUSES: Burnt-brick houses are somewhat more popular than concrete houses, unsurprisingly as they are a cheaper form of durable housing. Nonetheless, the distributions are still heavily skewed towards zero. However, the proportions of zero and non-zero values is again nearly identical: 38.7% (63/163) of the State land stratum had at least one burnt-brick house, as did 37.9% (39/103) of the traditional-land sample. The median test therefore does not show that the sampled strata are from populations with different medians (chi-square = .017, NS). As with concrete houses, the habitational non-agricultural improvement of burnt-brick houses is made on both State and traditional land with remarkably near-identical frequency.

OTHER TYPES OF FIXED INVESTMENT:

Boreholes: only 11 households (4.1% of the sample) had a borehole. Boreholes have extremely high unit cost relative to the other types of improvements, typically thousands of dollars. All of the boreholes in the sample were on State land.

Dams: only 14 households (5.3% of the sample) had a dam; of these, only one was on traditional land. Dams are generally a high-end farm investment and can be as expensive as boreholes, but they are more variable in quality and hence in cost, from simple labour-intensive earthen walls to concrete constructions.

Because of their high cost, doubtless boreholes and dams are for the privileged few, and their acquisition reflects wealth at least as much as tenure security. Yet this touches on a substantive issue: the major problem with smallholder farming in Zambia's Southern Province is vulnerability to drought. Boreholes and dams (control of groundwater and surface water) are the first-order technical means to escape that vulnerability. It cannot be ignored that, for

whatever reason, only farmers on State land are accessing this technology and level of investment.

Diptanks: Only two households reported diptanks (for cattle), both on State land.

Drainage: 15 cases reported having installed some length of drainage ditch, from 15 to 1500 meters. Of these, 8 were on State land (4.9% of the stratum), and 7 on traditional (6.8%). Drainage works are site-specific according to topography: some (perhaps most) fields do not need them. Drainage can be a defensive measure, against occasional excessive rain, or it can serve to bring naturally waterlogged land under cultivation. It is therefore hard to interpret as a continuous measure of fixed investment.

Terracing and bunds: Only four cases reported terracing (three on State, one on traditional) and one reported bunding (traditional land). As with drainage, these types of improvement are site-specific, and hard to qualify and quantify, as well as being scarce (since the study area is mainly flat and these earthworks are normally applied to inclined terrain).

SOIL CONSERVATION TECHNIQUES

Methods to conserve soil or maintain its long-term fertility (as distinct from short-term fertility which is improvable by chemical fertilisers) are analogous to tangible fixed investments, in that they require an initial outlay or effort, which then generates a return over a longer period. The outlay would be lost if the farmer were to leave the land without compensation before the investment's exhaustion; therefore, a farmer seriously fearing dispossession would have little incentive to bother with soil conservation techniques. Principal soil conservation techniques practised in the study area are crop rotation, manuring, and 'pot-holing.'

Crop rotation: This may be considered a fixed investment in that it helps to preserve soil fertility. Its adherence to the definition of investment is diminished by the fact that it requires little extra effort or actual investment. Also, it would necessarily be practised least by those with the least land, who must devote all of their scarce hectareage to the subsistence crop each year.

Crop rotation can be treated as a binary variable (either practised or not), or as an intensity index reflecting duration and extent (proportion of hectareage on which it is practised and proportion of years since acquisition in which it has been practised). In binary terms, 63.8% of the State land stratum practised at least some crop rotation, vs. 51.5% of the customary stratum. In the proportionate index, the part of the sample on State land had a slightly higher median intensity of practise, statistically significant at 10% (chi-square = 2.867, $p = 0.090$).

A logistic regression can be performed with crop rotation (binary) as the dependent variable. The independent variable of interest is land tenure category (State or customary). Also included is a variable for total hectares cultivated (in growing season 2000/2001), on the hypothesis that more hectareage under cultivation is associated with more crop rotation. The result produces an insignificant coefficient for the 'State vs. traditional' variable ($p = 0.580$), but that for 'area cultivated' is significant ($p < 0.01$) and has an Exp(B) value of 1.205 (meaning that for every one additional hectare cultivated, the average case is 20.5% more likely to be practising crop rotation). Area cultivated therefore emerges as an associate of crop rotation; but being on one or the other land category does not. The greater proportion of State land farmers practising crop rotation therefore turns out to be due more to the superior farm size on State land, than to any effect of the tenure category itself.

Manuring: This practice is ambiguous in investment terms, because it also yields a return (improved fertility) in the same season it is applied. In a situation where chemical fertilisers are becoming scarce and expensive, some farmers may turn to organic fertilisers as a short-term input, irrespective of its possible long-term contribution to soil fertility.⁹⁰ Nonetheless we examine whether there are different patterns of usage.

Like crop rotation, manuring can be treated as a continuous variable (reflecting extent and duration), or simply binary. Starting with the latter, manuring is (or has been) practised by close to half of each stratum, with customary land having a slightly greater occurrence (53.9%, vs. 48.7% on State). However, the chi-square (continuity correction) test of association between the two variables yields an insignificant result (chi-square[1] = .476, $p = 0.490$), and the null hypothesis is maintained. Treating manuring as a continuous variable (reflecting proportion of hectareage manured and proportion of years since parcel acquisition that manuring has been practised) shows slightly lesser amount of manuring on State land than on customary, but in no iteration does this achieve statistical significance. Therefore, according to the sample, the practice of manuring between State- and customary-land households does not differ.

Pot-holing: This is a minimum-tillage method promoted by aid agencies and agricultural agents mainly for the purpose of soil conservation (as it disrupts the topsoil less than full tillage). It consists of excavating by hoe a series of pot-sized holes in which seed and green manure are placed, instead of ploughing furrows. There are indications that the minority who

⁹⁰ Respondents specified that only the more decomposed underside of a pile of dung stimulates soil productivity the same year; the less decomposed top side works over the long term. Respondent no. 0720cn03 specified that manuring's effect on the soil lasts no more than four years.

practise it do so not for soil preservation, but for lack of animal traction.⁹¹ Nonetheless, since it requires a heavy initial effort, with benefits or returns spread over some years (the pot-holes are re-usable), and is immovable, it generally fits the definition of fixed investment.

Pot-holing is practised by only 9.2% (15/163) of the State-land sub-sample, and by 12.6% of the traditional-land sub-sample. The median test does not reject the null hypothesis (chi-square = .783, NS).

CONCLUSIONS ON INDIVIDUAL TYPES OF INVESTMENTS:

Examining the occurrence of individual types of investments between the State and customary strata shows that different patterns emerge with different types of fixed investment. In those that can be considered agricultural (wells, fencing, planted trees), households on State land showed greater levels (in the sense that a higher proportion were above the median and/or had non-zero values). The handful of major, expensive agricultural investments observed (boreholes and dams) were, with the exception of one dam on customary land, the exclusive domain of State-land households. In the habitation improvements (concrete and burnt-brick houses), there is a remarkable near-parity. In the low-cost, labour-intensive practices related to soil fertility management (crop rotation, manuring and pot-holing), there was a near-complete lack of distinction between the two strata; the apparently more common practice of crop rotation on State land turned out to be more directly related to farm size.

It remains to use systems of common units for fixed investments that permit aggregations of different types. The preceding profiles of investment composition by quintile of total investment clearly suggest that high-investment households accumulate greater levels of fixed investments not so much by installing extreme quantities of any one type, but by aggregating different types. This is common sense: after all, how many wells does a farm need? How many concrete houses? No more than a few of each probably. But some households appear to have the means and incentives to assemble different kinds of investments. We revisit this issue, now using aggregate measures of fixed investments as the dependent variable.

5.2.2.2 *Differences in Aggregate Fixed Investments*

Because high investors diversify their investment types as well as accumulating more of individual types, some kind of index is needed that aggregates the different types. Cost forms the dependent variable for this series of analyses.⁹²

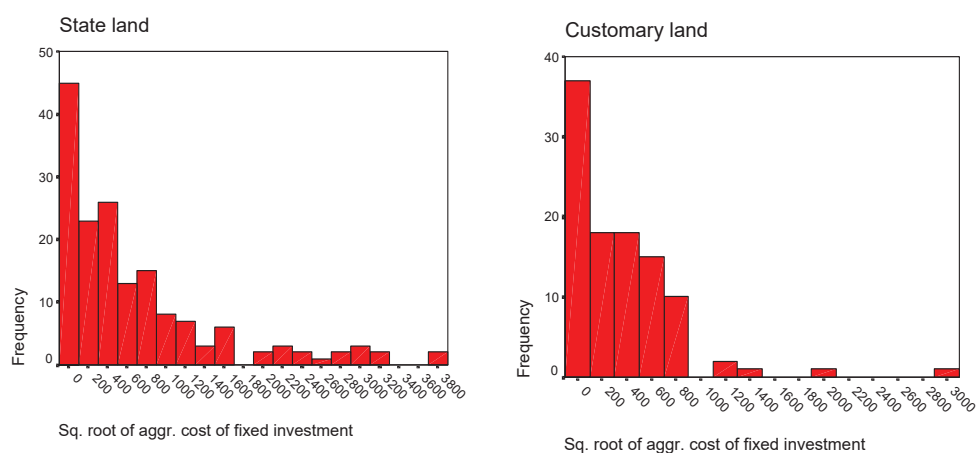
⁹¹ For example, in interview no. 0724ah02 (customary land), the respondent specified that they are pot-holing only because they lack oxen.

⁹² See Ch. 4, Section 4.6.3.1 for details on this variable's derivation.

The median test shows that on State land, 54% (88/163) are above the median investment level, compared to 41% on customary land (chi-square = 3.896, $p = 0.048$ after Yates' continuity correction).

Examining the distributions for each stratum (Figure 5.1, with aggregate investment cost square-rooted for clarity) shows that the difference seems to emerge only after a certain level of investment:

Figure 5.1: Histograms of Aggregate Fixed Investment for State and Customary Sub-samples



The shapes of the two distributions are similar between the levels of zero and about 800; above 800, there is only a handful of cases on customary land, but a higher proportion on State land. It is these that are boosting the State mean and median. Rather than a situation where nearly every State land household has higher investment than its customary land ‘counterparts,’ it seems that there is a high-investment sub-population on State land that is moving the mean and, to a lesser extent, the median.

It would be wise to double-check the aggregate investment costs (because they embody some estimates) with an alternative system of aggregation, point-scoring.⁹³ The means differ (9.7 on State, 4.8 on customary), as do the medians (5.4 on State land, vs. 3.3 on customary). The median test is significant (chi-square = 4.579, $df = 1$, $p = 0.032$). We therefore reject the null hypothesis and accept this as evidence that the proportion of State land households having aggregate fixed investment above the median is greater than the proportion of customary land households whose investment level is above the median, and therefore farming households on State land tend to have greater aggregate fixed investment than those on customary.

⁹³ Full details on the derivation of the point index appear in Annex A-1.2.

Moreover, the results are similar with investment measured by either point-scoring or cost, and therefore are not sensitive to method.

5.2.2.3 Conclusions on Differences in Fixed Investment between State and Customary Land

State households on average have greater aggregate fixed investment than customary households. Regarding specific types of investment, State households on average have greater quantities of agricultural improvements such as wells, fencing, and planted trees. Improved houses, by contrast, are more evenly distributed between State and customary households. Use of soil conservation methods (crop rotation, manuring, pot-holing) does not differ significantly between State and customary households, except that State households have a marginally higher prevalence of crop rotation, though this is shown to be due to the greater farm sizes on State land.

There remains a great deal more to examine. It is not the intention of this section to prove that fixed investment on State land is higher than on customary land, because that in itself would not be an interesting finding. Farmers on State-land settlement schemes were selected in part because of perceived propensity to invest, and after settlement they were administratively encouraged or even required to do so. Other socio-economic factors that contributed to settlement farmers' selection (such as educational attainment) must be controlled for, in case they have an effect on investment, apart from tenurial incentives.

The independent variable also needs more refinement, as being on State or customary land cannot be assumed to be a valid measure of tenure security. Therefore the bifurcation between State and customary land is now left behind. It will be more illuminating to introduce categories that reflect the heterogeneity of State land tenure (e.g. some farmers have titles, others have leases, others no documentation), and put those categories alongside customary.

5.2.3 Differences in Fixed Investments across Categories of Land Documentation

Documentation is one dimension of tenure status or security. It applies much more on State land than on customary, where titles for smallholders are theoretically obtainable but in practice rare (and non-existent in this study's sample). Documentation therefore serves to compare different categories of tenure on State land with each other and with customary land. This section tests whether greater tenure security, as represented by secure documentation, causes or is associated with greater fixed investment.⁹⁴

⁹⁴ The irony must be conceded of focusing on titles and other documents, after having reviewed their possible irrelevance (Ch. 2, Section 2.9.1). However such a convenient grouping should not be

Historically, settlement farmers were allocated parcels under 14-year leases, theoretically convertible to 99-year leases (locally called ‘titles’ – see Ch. 3, Section 3.3.3.6). However titles and even 14-year leases have been held up over the years for many settlement farmers by bureaucratic inertia. Also, a substantial minority of households was found to be sharing settlement parcels held by what they reported to be lease-holding or title-holding relatives; these are categorised separately from those who hold a lease or title in their own name. (Old settlement regulations, mostly neglected, forbid sub-letting of settlement parcels, so one suspects that some of these ‘invitees’ were actually *sub rosa* renters.) Consequently the State-land part of the sample was very heterogeneous in terms of tenure situation: 38 households had titles, 42 had leases, 22 were occupying part of a lease-holding relative’s parcel, 18 were sharing a title-holding relative’s parcel, and 43 were on State land with no document at all. The rest of the sample (103 households) were on customary land.

Households in the sample are categorised by type of land documentation to reflect this heterogeneity. The original categories recorded from questionnaires were: no documentation; HHH’s relative holds lease; HHH’s relative holds title; HHH holds lease in own name; HHH holds title in own name; HHH holds other document in own name. The categories were subsequently modified and re-combined as follows. The category of ‘HHH holds other document’ is collapsed into that of ‘no documentation,’ because the latter has only seven cases and it occupies an ambiguous interpretative area, representing a variety of documents of ill-defined legal weight (e.g. letters of permission from headmen, chiefs, or District Councils). The combined category (‘no documentation’) is then divided into those on customary land (where lack of land documents may mean little regarding tenure security) and those on State land (where documents reign).

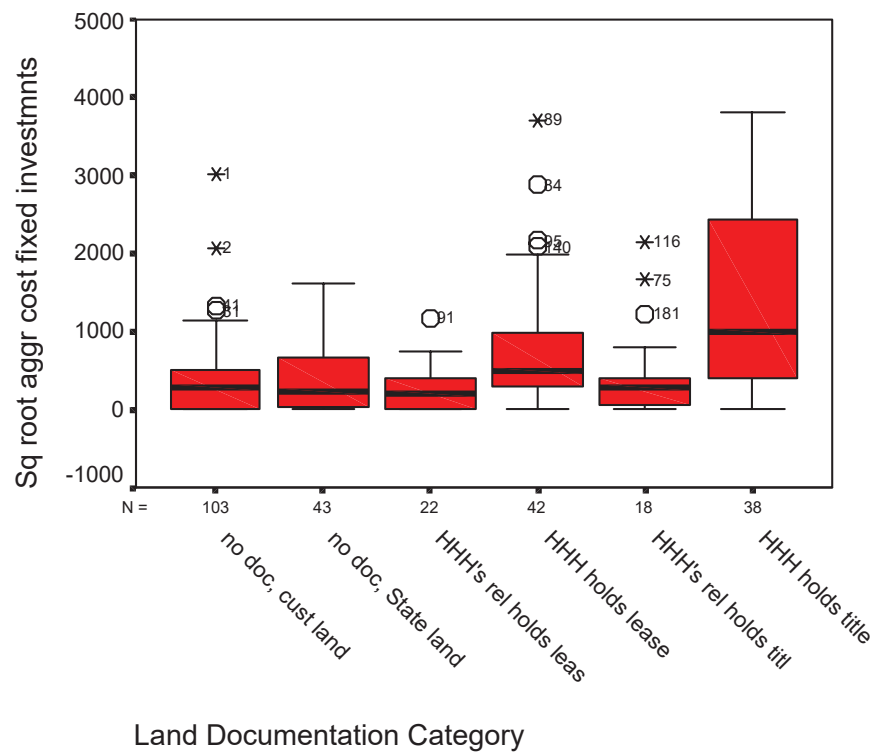
We will test the variation in fixed investment among these categories, first with simple differences in medians and means, then with regressions that control for possibly intervening or confounding socio-economic variables.

5.2.3.1 *Total Investment Across Documentation Categories*

The distribution of fixed investment scores (aggregate cost, square-rooted for clarity) in each category is represented by boxplots in Figure 5.2. (Medians appear as bold horizontal lines within the red boxes.)

overlooked. Later sections (5.2.4, 5.2.5) measure tenure more culturally (mode of acquisition) and perceptually (claimed security and transfer rights).

Figure 5.2: Aggregate Fixed Investment by Land Documentation Category (boxplot)



The medians visibly differ among categories, and a median test of these differences is significant (chi-square [5] = 23.514, $p < 0.01$). There appear to be two or three groupings among these categories: 'no document, customary land,' 'no document, State land,' and 'HHH's relative holds lease' differ little from each other or from 'HHH's relative holds title.' 'HHH holds lease in own name' has a higher median, and 'HHH holds title in own name' higher still. Thus in terms of aggregate fixed investments, farmers without documentation on State land behave virtually the same as those on customary land.

It is all very well to aggregate all investments accumulated over the years, but, it may be objected, surely this gives an advantage to those who have stayed longest on a parcel. Farmers such as those in the sample, arguably, are generally too poor and/or too cautious to install improvements all at once; the cautious farmer will choose to do so over a period of years, and the poor farmer has no choice. One response to this is that those who stay on a parcel longest would appear to have the best tenure security. However the objection is easily met by calculating a variable for average annual investment, being aggregate investment (cost) divided by number of years since parcel acquisition. A median test on the resulting variable across secure documentation categories is significant (chi-square = 32.309, $p < 0.01$), which is

sufficient to reject the null hypothesis and accept that annualised average investment costs, like aggregated (cumulative) costs, differ across land tenure categories—sharply, in some cases.

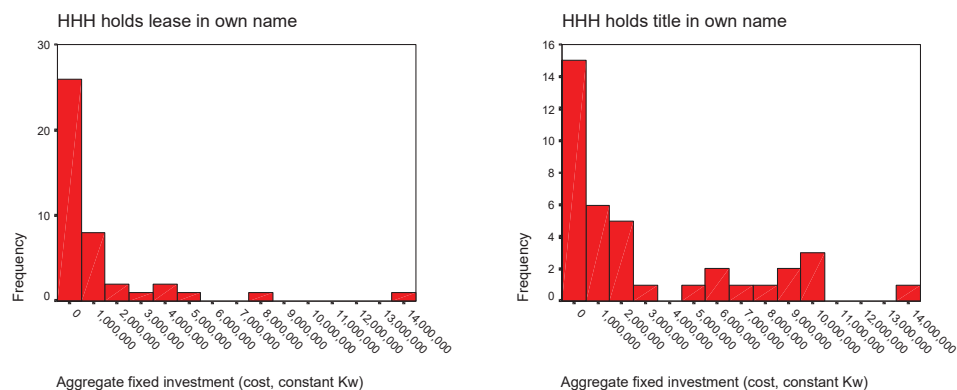
5.2.3.2 Robustness to Method: Using the Alternative Investment Measurement of Points

The analysis can be repeated substituting the point-scoring system for cost as the method to aggregate investments. The median test across documentation categories is significant (chi-square [5] = 33.496, $p < 0.01$). Roughly the same groupings emerge as in the previous median test on cost rather than points: ‘HHH’s relative holds lease’ is lowest, ‘HHH holds title’ and ‘HHH holds lease’ are highest, and the other three are closer to the low range than the high.

5.2.3.3 Differences Between Lease-Holders And Title-Holders

A two-way comparison of levels of investment of leaseholders and titleholders is substantively important. Is it the case that having a 99-year ‘title’ as opposed to a 14-year lease occasions a significantly greater level of investments? To analyse this, we examine the distribution of aggregate investment cost (square-rooted) in each category (Figure 5.3):

Figure 5.3: Median aggregate fixed investment, title-holders and lease-holders only (histograms)



It seems clear that the titleholders’ category has more cases with high values. Its median is Kw 1,001,569, vs. Kw 235,846 for the leaseholders. The median test is significant at 10% (chi-square [1] = 3.208, $p = 0.073$). We recall that the median test is relatively weak, less likely to ascribe significance to a real difference than its parametric counterparts, so this result is best viewed as positive rather than marginal. Titleholders’ mean is nearly twice as high, at Kw 2,990,044 vs. 1,243,547 for lease-holders. (No t -test is performed because of the non-normal distributions). If investment is measured in points rather than cost, the median of the

title-holder category is 12.80, vs. 7.58 for the lease-holder category. This difference is significant at 5% (chi-square [1] = 5.013, $p = 0.025$).

Annualised average investment should also be compared. A median test (investment cost) shows similar results: 40% (17/42) of lease-holders are above the median, versus 59% of the title-holders. The result is again significant at 10% (chi-square = 2.836, $p = 0.092$). The preponderance of evidence therefore supports the hypothesis that level of investment by titleholders is greater than that of leaseholders.

5.2.3.4 *Individual Types Of Investment Across Documentation Categories*

Table 5.4 (in Section 5.2.1) presented mean and median quantities of each main type of fixed investment per quintile of aggregate investment, so as to describe a profile of investment composition for each quintile. In this section, similar data are presented for each land tenure (documentation) category, to give an idea of what kind of improvements the typical titleholder, leaseholder, customary farmer etc. might have—a profile of investments per category. Table 5.6 summarises the prevalence and median quantities of fixed investments across documentation categories.

The percentage of households in each category that have at least one well is similarly low for ‘no doc, customary land’ and ‘no doc, State land’; somewhat higher for ‘HHH holds lease’ and ‘HHH’s relative holds title’; and near 50% for ‘HHH’s relative holds lease’ and ‘HHH holds title.’ Fencing is very much the province of lease- or title-holders, with about 40% of each having some quantity thereof, compared to very low proportions of households in the other categories. Tree-planting is considerably more common on all State land categories than on customary land. Moreover, median numbers of planted trees per household vary significantly across categories (chi-square = 28.220, $p < 0.01$), with leaseholders and titleholders clearly in the lead. For improved houses (concrete and burnt-brick types combined), the categories (except for ‘HHH’s relative holds lease’) are fairly even, although the median test is significant (chi-square [5] = 14.279, $p = 0.014$). The customary category again appears in the middle ranks for proportion having an improved house, recalling the earlier analysis between State and customary in which there was near-parity in the habitational improvements.

Table 5.6: Prevalence and median quantities of fixed investments by type across land documentation categories

TYPE OF FIXED INVESTMENT		No doc., customary land	No doc., state land	HHH's relative holds lease	HHH's relative holds title	HHH holds lease	HHH holds title
Well	% > 0	21.4	23.3	45.5	33.3	38.1	47.4
Fencing	% > 0	8.7	4.7	13.6	5.6	35.7	42.1
Planted trees	Median	0	4	4	4	9	11
	% > 0	38.8	69.8	81.8	83.3	69.0	76.3
Improved house	Median	1	1	0	1	1	1
	% > 0	51.5	51.2	22.7	50.0	64.3	68.4
Earthworks	% > 0	9.7	4.7	9.1	0.0	9.5	5.3
Dam	% > 0	1.0	0.0	0.0	5.6	4.8	18.4
Borehole	% > 0	0.0	0.0	0.0	5.6	4.8	15.8
Dip tank	% > 0	0.0	2.3	0.0	0.0	0.0	2.6
Minimum tillage	% > 0	12.6	11.6	13.6	16.7	7.1	2.6
Manuring	% > 0	53.9	47.6	36.4	38.9	56.4	54.1
Crop Rotation	% > 0	51.5	67.4	45.5	77.8	69.0	57.9
Aggregate investment (cost, constant Kw)	Median	84,525	49,543	43,105	84,223	235,846	1,001,569
	% > 0	75.7	86.0	81.8	100.0	95.2	97.4
Aggregate investment (points)	Median	3.39	3.04	2.76	3.00	7.58	12.80
	% > 0	79.6	93.0	90.9	100.0	95.2	97.4
Annualised investmt. (cost, constant Kw)	Median	5,544	6,122	5,560	14,653	24,983	68,677
	% > 0	76.5	86.0	81.8	100.0	95.2	97.3

Notes:

Constant (1995) Kwacha: Kw 864.26 = US\$ 1.00

Earthworks = drainage, contour ridging, terracing, or bunding.

Investments with no median noted had prevalence < 50% in each category, hence medians of zero.

To conclude, these data serve less to establish statistically significant differences in quantities across categories for any one type of investment, than to sketch profiles of the investment portfolio for each category. They also outline distinctive patterns for each type of investment: the distinction between agricultural and habitational types mostly holds, with the latter having more even popularity across State- and customary-land households.

5.2.3.5 Controlling for the effects of other socio-economic factors on fixed investment

The possible role of intervening or confounding variables, such as greater income, education, or farm size, is yet to be explored. Farms on State settlement schemes were designed to be larger and wealthier, and (in some cases) encouraged to have greater levels of investment, than customary farms. These elements that do not relate to tenure-based incentives will be controlled through inclusion in regressions. For convenience, 'no document, customary land' will be the reference or 'base' category for all the following regressions, with the other categories represented by dummy variables.

CONTROL VARIABLES

We derive a model of possible factors influencing the dependent variable (level of fixed investment). The list is inclusive, because the purpose of the model is to identify important factors (starting from an agnostic position), more than to measure the precise magnitude of each's effect, which would be more accurately accomplished with a reduced model. Apart from the independent variable of interest (tenure), such factors may include:

- Head of household (HHH) Age
- HHH Educational level / attainment (measured as highest grade completed)
- Household Income
- Area under cultivation
- Endowment from parents / Parents' socio-economic status
- Household size / labour force
- Distance to market
- Years since parcel acquisition
- Cattle ownership

The thrust of these variables is to control for factors related to the historical administrative selection of settlement farmers by identifying some antecedents that might in turn explain their administratively-perceived 'progressiveness.' In other words, this is intended to take away whatever selected advantage that settlement farmers as a population may have had over non-selected customary farmers. Of these control variables, HHH's educational level and endowment from parents are most clearly antecedent. Endowment from parents is an index of standardized scores of two manifest interval-level variables: HHH's father's educational attainment (highest grade completed), and HHH's father's land holdings (in hectares). The logic is that the greater a respondent's (or respondent's parents') score on these, the greater early advantage the respondent had in farming, irrespective of the independent variable of interest (land tenure).

Of the many ways of measuring household income, in this study it is derived as market value of crops, less crop input costs, plus any other reported income (vegetables, livestock, trade, remittances etc.—see Annex A-1.3). Household income was calculated only for the 12 months preceding the survey. As such it is an imperfect representation of the influence of income on fixed investments, because most fixed investments were installed earlier. However limitations of respondent recall and high inflation over the years made it impractical to try to collect data on income for previous years. The variable 'HH income' therefore should be understood as a

proxy for income history over the years of possession of the farming parcel; the latter (if it were available) would better reflect the effects of income on fixed investment. Despite this difficulty of timing, the fact that mean income varies considerably across land categories makes it advisable to include it in the model.

Household size could affect fixed improvements either positively or negatively: more household labour may go towards building labour-intensive improvements, or may obviate labour-saving improvements. The actual variable used, in order to focus on labour availability, will be ‘HH labour force’ which is simply all those in the household aged 12-64.

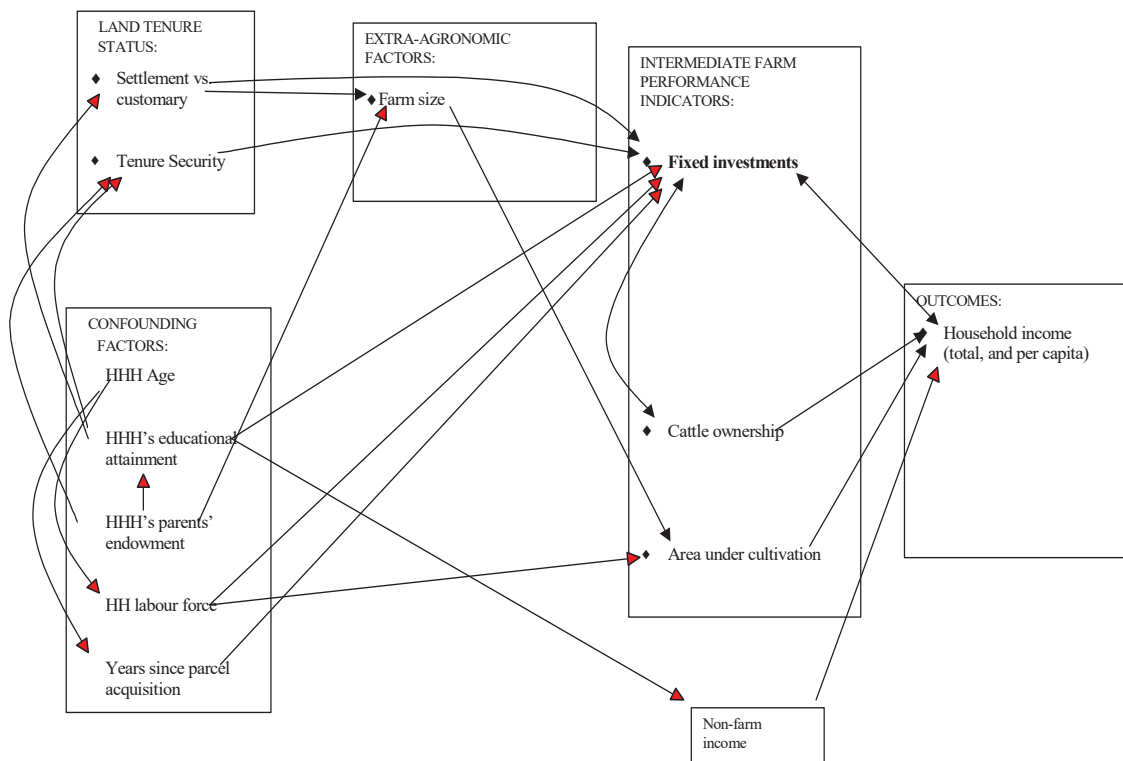
Total farm size differs from area cultivated, sharply in the case of allocatees of settlement farms (see Table 5.1, above), many of which were administratively designed for economies of scale and to incorporate grazing areas. For analysis of the determinants of fixed investment, total farm size is used as a control variable instead of area cultivated, because it is more antecedent (data were collected on hectareage cultivated only over the most recent 2000/2001 growing season) and because it has more obvious links with investment supply and demand, as well as possible links to credit supply (to the extent that lenders are confident of large-farm owners’ ability to repay). (For analysis of determinants of productivity in Chapter 6, area cultivated is used.)

Regarding cattle ownership, it will be recalled that some of the common fixed investments (like wells and fencing) are used largely for cattle. It is possible that cattle ownership provides an incentive, or the means, or both, for these improvements.

On a substantive level, we would not be surprised if certain documentation categories (e.g. title-holders) are shown to have a strong association with level of fixed investment, even controlling for other factors related to administrative selection. It may be that richer people managed to be first in line for settlement farms, and then went on to become the high-level investors. There may therefore be a question as to the direction of causality. Furthermore, many such settlement schemes theoretically required fixed investment as a condition of lease renewal or granting of title (though enforcement may have been sporadic—see Section 5.2.3.7 below for further data); therefore it would not be certain that any such strong correlation is caused by land tenure incentives, instead of simple administrative pressure.

Figure 5.4 is a flow chart of the causal model composed of these factors (modified from Figure 4.3 in Ch. 4 to focus on fixed investments).

Figure 5.4 Causal model of factors of fixed investment (flow chart)



Regressions were performed on fixed investment measured by cost and by points. The cluster of cases with zero investment (38 cases by cost, and 26 by points⁹⁵), and further concentrations in low positive values, amounts to a censored distribution⁹⁶ which permits Tobit regression. Four outlying cases of cattle ownership (more than 100 head) are excluded, as is one case (for the regression on investment points) with an extreme high value of fixed investment.⁹⁷

In the regression on fixed investment measured by cost (Table 5.7, column 1), variables with significant coefficients include: 'Number of cattle owned,' 'HHH's education,' 'Years since farm acquisition,' 'HHH holds title,' and 'Total farm size.' When investment is measured by

⁹⁵ The difference represents cases with investments for which no cost could be derived but for which a point score could be estimated. Most such investments required only labour, such as earthworks.

⁹⁶ The data are censored (rather than arriving at a natural endpoint of zero) because negative investment is possible in principle, e.g. clear-cutting trees or over-grazing, though such manifestations are unmeasured in this study. Furthermore, such negative investment behaviour would be theoretically affected by tenure (in)security in the same way that positive investment may be stimulated by tenure security.

⁹⁷ This case had 244 points, nearly all owing to a plantation of some 3,000 banana trees. Such trees count for somewhat more in the point-scoring system than the estimated cost system.

Table 5.7: Regression results, determinants of fixed investments

Independent Variables	Dependent Variable			
	Column 1		Column 2	
	Aggregate fixed investment by cost (tobit regression)		Aggregate fixed investment by points (tobit regression)	
	Coefficients	SE	Coefficients	SE
(Constant)	-1436168.00	645603.00 **	-3.88	3.64
	(-2.22)		(-1.07)	
No document / customary land	(reference category)		(reference category)	
No document / State land	-225677.70	352068.20	-1.42	2.01
	(-0.64)		(-0.71)	
HHH's relative holds lease	-28904.48	440332.20	-0.55	2.50
	(-0.07)		(-0.22)	
HHH's relative holds title	514682.30	472741.50	0.35	2.73
	(-1.09)		(0.13)	
HHH holds lease	454853.90	374474.20	2.07	2.16
	(1.21)		(0.96)	
HHH holds title	1107021.00	453087.10 **	5.49	2.62 **
	(2.44)		(2.09)	
HHH Age	-10317.39	9775.52	-0.08	0.06
	(-1.06)		(-1.44)	
HH labor force	26889.72	25604.87	0.46	0.15 ***
	(1.05)		(3.10)	
HHH's education	109531.80	43330.55 **	0.72	0.25 ***
	(2.53)		(2.90)	
Parents' wealth index	130974.20	835334.03	0.42	0.48
	(1.57)		(0.87)	
Total farm size (ha)	13371.65	4007.68 ***	0.07	0.02 ***
	(3.34)		(2.90)	
Total HH income 2000/01	0.03	0.03	0.0000007	0.00000 ***
	(1.13)		(3.98)	
Years since farm acquisition	41603.45	12978.63 ***	0.20	0.07 ***
	(3.21)		(2.74)	
Distance to market	5388.01	15833.96	-0.06	0.09
	(0.34)		(-0.66)	
Number of cattle owned	52672.32	10579.74 ***	0.21	0.06 ***
	(4.98)		(3.41)	
Number of observations	240		239	
No. of left-censored obs. at zero	34		26	
LR chi ² (14)	128.41		142.65	
Prob > chi ²	0.0000		0	
Pseudo R ²	0.0192		0.0808	
Log likelihood	-3271.5457		-811.8813	

Note: Numbers in parentheses are *t*-values.

*Significant at 10%; **Significant at 5%; ***Significant at 1%

points (Table 5.7, Column 2⁹⁸), the same variables have significant coefficients, joined by “HH labour force” and “total HH income.”

To interpret: with reference to the base category of the respondent households on customary land, and controlling for the full set of socio-economic factors, those households in the categories of (a) occupying state land with no document, (b) occupying part of a relative’s state parcel for which the relative holds a lease or title (in other words, lacking a document in their own name), and (c) holding a lease in their own name, do not differ significantly from the reference category of customary farmers. Those households where the HHH holds a title do differ, even controlling for socio-economic factors (that may have influenced the historical selection of settlement farmers) and some parcel attributes (total farm size, distance to market, years since acquisition). Recalling that both lease- and title-holders have sharply higher aggregate investment than the other categories in simple cross-tabulation (Table 5.6), these regression results indicate that all of the lease-holders’ superiority is attributable to the significant control variables, but that title-holding still has an independent positive effect on investment.

This is a substantively interesting result. Because it makes clear that having been allocated (or sharing) a state settlement parcel without documentation is not a sufficient condition to stimulate investment behaviour different from customary-land farmers, the results are consistent with a hypothesis that land tenure security (as defined by documentation) is positively associated with the level of fixed investments. Title-holders’ superiority over lease-holders (in that they differ significantly with the base category but lease-holders do not when control variables are included in the model) is also consistent with this hypothesis, given that titles can only be interpreted as bestowing greater (or at least longer) tenure security than leases. Moreover, being on state land *per se* is an insufficient condition for greater investment: customary farmers actually invest more than undocumented state-land farmers, though not significantly more.

Cattle ownership has an independent and relatively strong association with fixed investments. The line of causality may run from cattle to investments, if the purpose of the investments is to service cattle (e.g. water points and fencing), and also if cattle facilitate investments by improving labour productivity, securing credit, or multiplying wealth. Possibly it also runs the other way, if fixed investments generate income that is used to buy cattle, or if keeping more

⁹⁸ Numbers of observations in these regressions are less than the full sample size of 266 because of missing values in some cases for HHH age and HHH education (respondents did not know), as well as the cases excluded for extreme values as described. Because HHH education emerges as strongly significant, deleting it from the model is not an option, and one hesitates to impute the mean.

than a few head of cattle is only feasible with investments like wells and fencing, and therefore the desire to keep bigger herds motivates the investment.⁹⁹

The significance of total farm size may be due to either supply or demand effects: supply, in the sense that greater farm size may lead to greater income or credit,¹⁰⁰ and demand, in the sense that farm size necessitates or perhaps affords the opportunity for greater investment (for example, it costs more to fence 100 ha than 5 ha). The positive effect of HHH's education on investment may operate through intervening mechanisms such as greater historical income, or directly through farming choices.

Lastly, the fact that title-holding's independent association with greater investment is significant (and that of lease-holding is not) whether investment is measured by points or by cost suggests that the finding is not sensitive to method.

5.2.3.6 *Examination of the Category of 'No Document, State Land'*

It may be wondered, who are these farmers on State land with no documents, whose investment interestingly fails to differ from customary farmers—are they the principal assignees, in the sense that the settlement parcel was allocated to them even though the documentation hasn't come through yet, or are they invitees of the principal assignee, in the same sense of the households that share part of a parcel at the invitation of a lease- or title-holder? One would expect that the principal assignees have greater incentive for fixed investments than invitees: their land rights come through official allocation (even without documentation) rather than informal sub-let; and they may wish to strengthen or accelerate their application for documentation by showing advanced farming methods and good land use through investments. If such principal assignees without documentation still had less investment than principal assignees with leases or titles, it would be strong evidence of the association between documentation and fixed investment. If, however, those households in the category of 'no document / State land' are mostly invitees, one would expect such putative incentives to be less in force; and therefore any difference in investment levels would not be such strong evidence, because invitees are less comparable to principal assignees.

Although the questionnaire included no direct question as to whether respondent households without document are the 'principal assignee' or an invitee, this distinction can be gleaned

⁹⁹ It is perhaps interesting to consider that cattle, to the extent that they are used in the study area as a form of saving, represent mobile investment. There appears to be no general substitution of one for the other as tenure security increases; cattle and fixed investment co-vary positively.

¹⁰⁰ Land mortgaging did not occur in this sample. However, credit supply may be stimulated by farm size (or indeed by documentation) through a perceived effect on ability to repay, which a lender may see as a more important loan security than the possibility of foreclosure.

from cross-tabulation with another tenure variable, ‘mode of acquisition’ (Table 5.8). The column under ‘No doc, State land’ (in bold) shows that this category covers a variety of conditions. Only 6 out of 43 without document on State land are the principal assignees of parcels. Four cases are categorised as ‘invited to share by assignees without document’ where interview notes show such. Others are inheritors or recipients of *inter vivos* transfers from occupiers who are either principal assignees or themselves invitees (interview notes did not specify which). There are a handful of other categorisations.

In terms of the above-mentioned caveat then, it seems that only a small minority (6/43) are closely comparable to leaseholders and titleholders in the sense of being the principal assignee of the land in question. The ‘strong evidence’ from the last regression showing association between documentation and fixed investments should therefore be interpreted with caution, due to the complexity of categorising these tenure statuses. We note, however, that this category of ‘no document / State land’ performs the same in the regression as categories 3 and 4 (relatives of lease- or title-holders) in that none differs significantly or with great magnitude from the reference category of customary farmers. The evidence therefore remains fairly strong.

Table 5.8: Land Documentation Category crossed with Mode of Acquisition

		Land Documentation Category					
		no doc, cust. land	no doc, State land	HHH's relative holds lease	HHH's relative holds title	HHH holds lease	HHH holds title
Tenure status in terms of Mode of Acquisition	inherited from man's (husband's) parents	18	4	1	1	4	1
	inherited from man's (husband's) other relatives	6	3				1
	inherited from woman's (wife's) parents	2					
	inherited from spouse	1					
	inter vivos transfer from spouse	1					
	inter vivos transfer from man's parents	20	7	6	6		2
	inter vivos transfer from man's other relatives	10	3	1			1
	inter vivos transfer from woman's parents	3					1
	inter vivos transfer from woman's other relatives	2					
	allocated by headman or chief	34	3				
	Leased (14-year) from State or sett scheme			5	1	36	25
	Obtained title (99-year) from State or sett scheme						4
	invited to share by leaseholder			9			
	invited to share by titleholder				9		
	squatter	1	2				
	cleared the land myself	2	1				
	purchased	1	5		1	2	3
	other	2	5				
	Allocated State land but hasn't received document yet		6				
	invited to share by assignee without doc		4				
Total		103	43	22	18	42	38

5.2.3.7 Investment Behaviour Before And After Obtaining Documentation

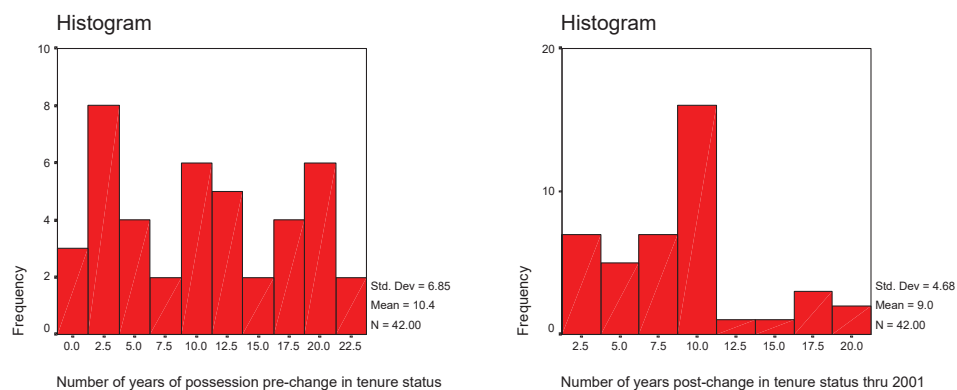
Another way of testing whether land documentation affects fixed investment is to examine behaviour before and after obtaining documentation. The preceding analyses use independent samples, in which each case falls into one documentation category, and has one datum for (accumulated) investment. However this risks missing the phenomenon of cases that have changed the tenure status of their land at some point in time (e.g. obtaining a title), and whether their investment rate differed afterwards. Such phenomena would allow a within-

subjects (or ‘paired-samples’) approach.¹⁰¹ The necessary data were obtained on year of initial parcel acquisition, year of the change in status, and the year of each fixed investment on that land, to compare the quantity before the change with after. However only a relatively small sub-sample reported having experienced such a change in tenure status, and the sub-sample was further attenuated by missing data for some of these variables. We are thus left with a small usable sample of 46 cases, or 17.3 % of the whole sample.

To preserve sub-sample size, we group together the cases that obtained a lease and those that obtained a title subsequent to initial acquisition, irrespective of the terms of the initial acquisition. Those who initially obtained a lease and subsequently obtained a title are grouped with those who initially occupied the land with no document and subsequently obtained either a title or a lease. The justification is that any of those changes represents a boundary between an inferior condition (in terms of secure documentation) and a superior one.

How many years have the cases passed before and after the change in tenure status (Figure 5.5)?

Figure 5.5: Histograms, Number of years of possession pre-change in tenure status and Number of years post-change in tenure status thru 2001



There is no central tendency in the number of years pre-change, but a strong modal value of about 10 years for post-change. (Ten years before the period of this study was 1991, a presidential election year, which seems to have coincided with an accelerated granting of documents, perhaps for vote-hunting purposes.) The means are similar (10.4 and 9.0 years).

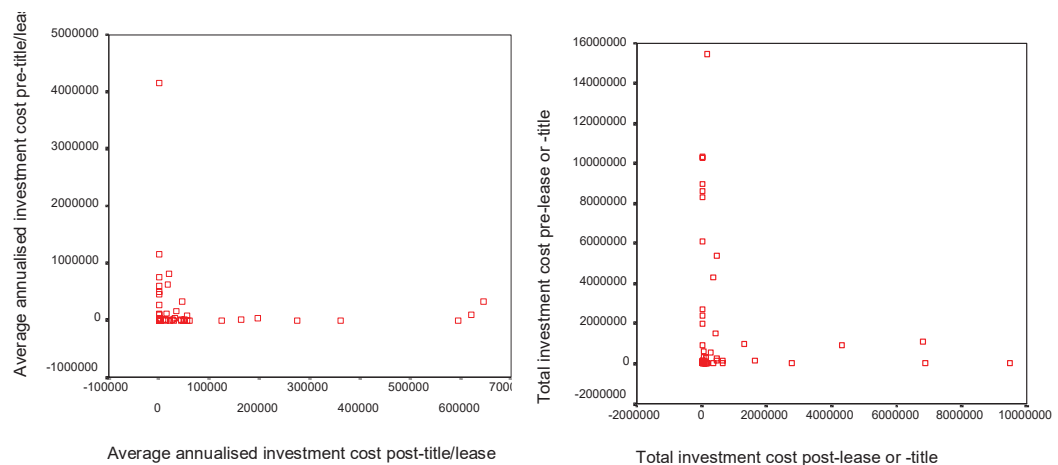
¹⁰¹ A similar within-subjects approach would have been possible for cases that have multiple parcels under different tenure conditions, to see if they chose to put more fixed investment on parcels with better tenure security. However the survey identified only a handful of such cases, too few for statistical analysis.

To avoid possible skewing of results by lopsided ratios of years before and after obtention, annualised averages of investment pre- and post-obtention are used.

Medians of annualised investment pre- and post-obtention are similar: Kw 21,131 annual average pre-obtention, vs. Kw 19,931 annually post-obtention (constant 1995 kwacha). (No significance test is available for medians of paired samples.) In terms of ‘market breadth’ (the number of cases with greater average annual spending on fixed investments pre-obtention compared to the number with greater annual average post-obtention, irrespective of how much greater), 57% of cases had greater average annual investment spending pre-obtention. These results certainly indicate no uniform trend of accelerating investment after obtention. Investment spending does increase post-obtention if the sub-sample is limited to only those who occupied or were allocated state land with no document, and subsequently (more than one year later) obtained a lease, i.e. excluding those who started with a lease and subsequently upgraded to a title. Only eleven such cases occur in the sample.

Plotting average annual and total investment pre-obtention against that for post-obtention (Figure 5.6) reveals an interesting phenomenon. Most cases fall on or very near either axis, indicating that most investment happens either pre- or post-obtention, but rarely both. Few invest very much both before and after, and the cases are fairly evenly divided between the axes. This apparent bipolarity of reaction to document obtention—some stop investing, others start—seems to indicate two separate processes or motivations, but does at least suggest that obtention is a defining moment.

Figure 5.6: Annualised Investment pre-change vs. post-change; Total Investment pre-change vs. post-change



From this analysis, there is scant evidence of any majority trend of heavier investment after obtaining an improvement in documentation. Indeed the narrow majority of indications go the opposite way. Only in the small sub-sample of cases who started with no document and subsequently obtained a lease does the majority show greater investment post-obtention. The fact that this does not hold for cases who started with a lease and moved to a title suggests that for the majority of cases, leases are sufficiently security for fixed investment. This parallels previous analyses of investment level by land documentation category, in which leaseholders' aggregate investment, although lesser than title-holders', was generally of a similar order of magnitude and superior to other categories.

It would be premature to conclude from this that leases and titles make no difference to farmers' investment behaviour. This result is from a small sub-sample, a substantial minority of whom (43%) did invest more after obtaining documentation, or more precisely (given that few cases invested much both before and after), waited until obtaining to invest. It is possible that those with greater pre-obtention investment had reason to believe in advance that they would obtain a land document (a 'tenure track'), and so invested without fear. Also, obtaining title was reported to be in itself a considerable investment (in time, fees, surveying and other costs) that may have drained households' resources for a time.

For those who only invested before obtaining, it is possible that causality runs in the opposite direction (endogeneity, as explored in Deininger et al. 2003 and Brasselle et al. 2002): consideration of tenure security may have led farmers to invest in order to enhance their claim to lease or title, rather than obtaining security so as to be able to invest safely. This recalls the settlement policies that required improvements as a condition of title; however the study also found evidence that cast doubt on the influence of such policies. The sporadic historical enforcement of the policies is evidenced by the fact that five of the sample's 38 title-holders reported fixed investments of no more value than Kw 1,630 (US\$1.89). Also, in the respondents' comments presented in Section 5.1.2.5, those who described the link between title and investment clearly described investment following security; none described investing in order to strengthen a claim to lease or title. Moreover, respondents were asked what improvements if any they had been required to install; among titleholders, 52% responded none. Of those who responded in the affirmative, 50% specified fencing, 31% concrete house, 6% tree-planting, and 13% "other" as the required improvement. Of those who reported such a requirement, 27% of these titleholders confessed that they had not made the required improvement. Taken together with the 52% who reported no such requirement, this means that three-quarters of the title-holding sub-sample evince no relation between fixed investments and compliance with settlement regulations to the extent necessary to win title. This seems to weaken any supposition about reverse causality. Leaseholders, incidentally,

reported the existence of this sort of requirement, and compliance thereto, at about the same rates as titleholders, which would contradict a supposition that title-holders' greater investment is due to them having experienced more such requirements, and/or having complied to a greater extent than lease-holders.

More broadly, raising the possibility of endogeneity has made a valuable contribution to the land tenure debate and serves as a warning against premature conclusions. However the consideration of endogeneity becomes misguided if it implies a false dichotomy that either fixed investments cause tenure security, or the reverse. A mixture of processes, incentives and motives is more likely to be the reality. In a simplified example, an ambitious farmer may fear to invest heavily on her customary parcel because it might attract envy and therefore worsen security. She therefore obtains a leased settlement parcel. She makes fixed investments, believing that this will strengthen her application for title; but it is simultaneously true that she would not have made those investments on customary land, for reasons unrelated to the possibility of obtaining title. What may be taken as endogeneity is therefore in fact a kind of marriage of motives and incentives across different tenure situations: she makes the investments because she is on the tenure track, and is on the tenure track because she makes the investments. Finding that reverse causality exists in some case studies is interesting, valuable and should prompt further research; but by itself it does not negate evidence in other case studies that tenure security increases investment demand.

5.2.3.8 *Conclusions on Differences in Fixed Investment across Categories of Land Documentation*

Recalling the hypothesis and sub-hypotheses that prompted this investigation of fixed investments:

Farmers with greater tenure security have accumulated greater fixed investment on their land. (Farms on State land have greater mean fixed investment than farms on customary land; Farms on State land that have titles, have greater mean fixed investment than farms on either State or customary land that do not have titles.)

The data consistently support the hypothesis that farms on State land have greater mean (and median) fixed investment than those on customary land. As noted, this is not in itself an interesting finding. However the data also support the hypothesis that titled farms have greater investment than untitled farms on either State or customary land, and more interestingly, that households on State land without their own leases or titles do not differ significantly from households on customary land in terms of fixed investment, controlling for socio-economic

factors as well. The causal role of titles or leases in stimulating investment is cast into some doubt by the finding that, for the small sub-sample who obtained a lease after some time of occupation without one, or a title after a lease, investment accelerated after obtention of the document in no more than a large minority of cases. Nonetheless, the clear superiority of title-holders' investment (Table 5.6) survives even when subjected to an array of control variables, while that of holders of weaker leases does not. It is conceded that the more complex quantitative tests presented in this section tend to have more imperfections of precision and conformity to assumptions; however, the consistency that the results show from simple to complex tests makes a strong cumulative argument for the reliability of the overall findings.

This section has examined the association between land documentation and investment, controlling for socio-economic factors. The next section will test a different iteration of tenure status or security as a determinant of fixed investment relative to the same control variables: mode of acquisition.

5.2.4 Differences in Fixed Investment According to Modes of Land Acquisition

Using mode of acquisition as a proxy for tenure security is typically indicated for customary land where the mode of acquisition usually defines property rights. Moreover, with customary rights, no obvious mechanism exists to supersede rights derived from mode of acquisition with new sets of rights, as happens on State land for instance when a title supersedes a lease. Therefore, on customary land, mode of acquisition is likely to be a relevant indicator of current land rights even many years after acquisition; and farmer behaviour may have been influenced thereby. This may be less true on State land, where leases expire, government policy fluctuates, and titles are granted unpredictably; in short, mode of acquisition does not permanently define land rights on State land as it does on customary.¹⁰² The analysis is more likely to reveal interesting distinctions on customary land than on State land. We will therefore test the whole sample together, then customary land separately.

¹⁰² The question therefore arises how to treat parcels acquired under leasehold and subsequently converted to title. The treatment should be consistent with the purpose of the independent variable which is to test whether tenure security (as approximated by mode of acquisition) has conditioned farmers' investment decisions. It is therefore decided that farms on State land for which title was obtained within three years of initial acquisition will be treated as having been obtained under State title, because the application for title would have had to have been made at or about the time of acquisition in order to be issued within three years. Those farms for which title was obtained after more than three years will be treated as having been acquired under leasehold, or whatever arrangement (such as assignation without document) prevailed at the acquisition date. See Section 5.2.3.7 above for another way of treating the problem of mid-course change in tenure status.

5.2.4.1 Categorisation of Modes of Acquisition

Responses to questions on mode of acquisition were recorded in detailed categories (whether inheritance or *inter vivos* transfer, from man's or woman's parents or from other relatives, allocated by headman or chief, leased or titled from State, etc.). These profuse categories could be re-combined in several meaningful ways, depending on which distinctions are desirable to test. In view of previous deductive and empirical work on possible effects of matrilineal allocation on farmers' incentives (Bruce and Dörner 1982, Place *et al.* 1995), it would be interesting to re-combine so as to distinguish acquisition from parents (i.e. non-matrilineal) against acquisition from other relatives. This results in the following frequencies (Table 5.9):¹⁰³

Table 5.9: Modes of Acquisition

		Frequency	Percent
Valid	A. Inherited or inter vivos from man's parents	70	26.3
	B. Inherited / inter vivos from man's other relatives	25	9.4
	C. Inherited / inter vivos from woman's parents or relatives	8	3.0
	D. Inherited / inter vivos from spouse	2	.8
	E. allocated by headman or chief	37	13.9
	F. Leased (14-year) from State or sett scheme	67	25.2
	G. Obtained title (99-year) from State or sett scheme	4	1.5
	H. invited to share by lease/titleholder	18	6.8
	I. cleared the land myself	3	1.1
	J. purchased	12	4.5
	K. squatter / other	10	3.8
	L. Allocated State land but hasn't received document yet	6	2.3
	M. invited to share by assignee without doc	4	1.5
	Total	266	100.0

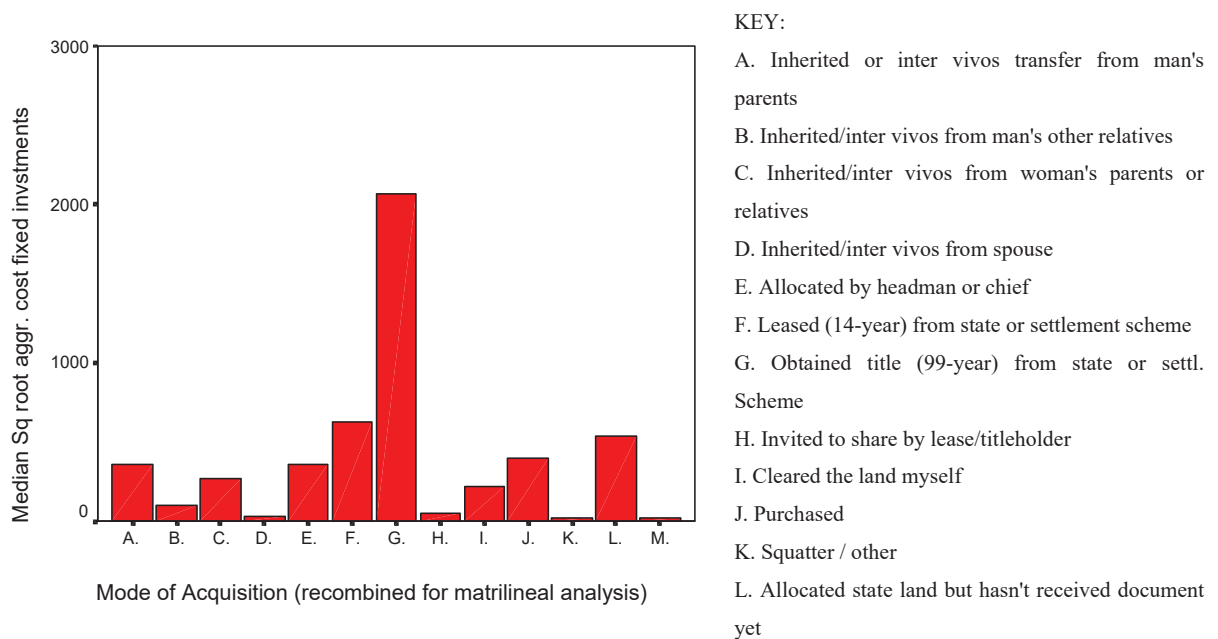
¹⁰³ Inheritance and inter vivos transfers are combined in this iteration. Separate analysis shows no significant difference in investment if cases are categorised as 'Inherited from male's parents/relatives' and 'Inter vivos transfer from male's parents/relatives.'

Some of these categories have low frequencies, but the two of most interest to the matrilineal question (from man's parents vs. from man's other relatives) have frequencies likely to be sufficient to yield significant results.

5.2.4.2 Fixed Investment by Category of Mode of Acquisition

Figure 5.7 plots median aggregate fixed investment (cost, square-rooted for clarity) per acquisition category:

Figure 5.7: Median Aggregate Fixed Investment by Mode of Acquisition



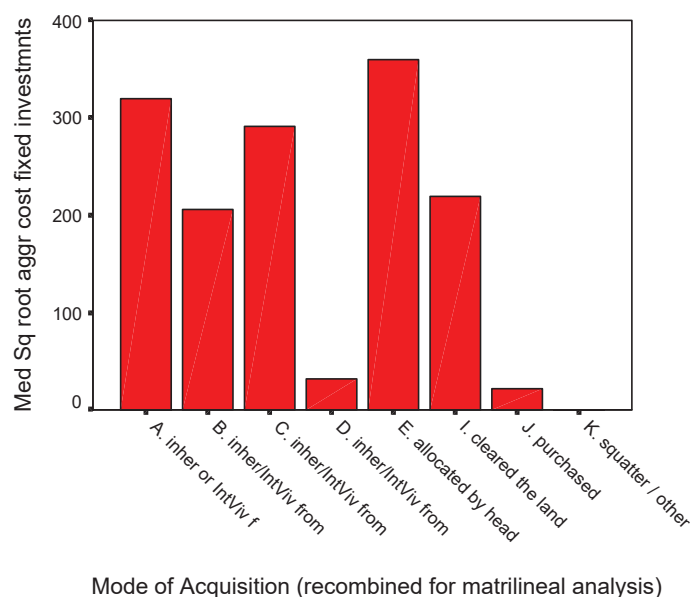
Several interesting features are evident. Category G ('obtained title from State or settlement scheme') is several times higher than the rest. There are only four cases in this category (defined, as explained, as those who obtained title within three years of acquisition), so no statistical significance is expected. (However, its large superiority is striking and suggests some connection with their rapid obtention of title.) Category L ('allocated State land but hasn't received document yet') appears to have a similar level as category F ('leased from State or settlement scheme'), suggesting that bureaucratic delays in obtaining the lease do not discourage moderate investment; but again with only six cases in category L, conclusions cannot be generalised. Category H ('invited to share by lease/titleholder') is nearly as low as category M ('invited to share by assignee without document,' only four cases), suggesting that a lease or title in the hands of a relative is little assurance. On the main topic, there appears to be a sizeable difference between investment on land obtained from parents (Category A) and that obtained from other relatives (B), suggesting less investment on matrilineal land. This is

better illustrated and tested after excluding cases on State land, which yields the following frequencies (Table 5.10) and medians (Figure 5.8):

Table 5.10: Modes of Acquisition (Customary sub-sample only)

		Frequency	Percent
Valid	A. Inherited or inter vivos from man's parents	38	36.9
	B. inherited / inter vivos from man's other relatives	16	15.5
	C. inherited / inter vivos from woman's parents or relatives	7	6.8
	D. inherited / inter vivos from spouse	2	1.9
	E. allocated by headman or chief	34	33.0
	I. cleared the land myself	2	1.9
	J. purchased	1	1.0
	K. squatter / other	3	2.9
	Total	103	100.0

Figure 5.8: Median Aggregate Fixed Investment by Mode of Acquisition (Customary sub-sample only)



Although Category A (non-matrilineal) has greater investment than B by about 50% (or by 125% without square-rooting), the median test fails to find significance for the differences in medians (chi-square = 6.887, $p = 0.441$). Narrowing the test to categories A and B also fails to

produce significance (chi-square = 0.355, $p = 0.551$), as does a comparison between the latter and category E ('allocated by headman or chief') (chi-square = .368, $p = 0.544$).

5.2.4.3 *Conclusions on Differences in Fixed Investment according to Mode of Acquisition*

The differing medians within the sample cannot be generalised to the population, and the null hypothesis, that there is no difference in fixed investment between matrilineal land and other customary land, cannot be rejected. This does not mean that tenure status or security has no association with fixed investment on customary land; it may mean instead that the major categories have similar degrees of security. The low frequencies in the two main categories of interest (38 in A and 16 in B) may be responsible for preventing the clear differences within the sample from achieving statistical significance.

5.2.5 **Effects of Perceived Tenure Security on Fixed Investments**

If mode of acquisition does not reveal any distinctive patterns of investment behaviour on customary land, would another conceptualisation of tenure status do so? Respondents' subjective perceptions of tenure security may form a new independent variable. Such a variable would tend to have high validity, as the neo-classical model depends on perceptions of tenure security rather than any objective indicators of types of tenure. Yet it would also be vulnerable to measurement error, as would any variable that tries to quantify perceptions of a non-quantitative condition, and especially one that asks respondents to confess weakness (thereby prompting strategic responses). Nonetheless, if one wishes to know which respondents have insecure tenure, one should not overlook the direct route of asking them.

This line of inquiry on perceptions may seem to be the tip of the iceberg in which land is analysed as an object of social relations, processes, and negotiation (*à la* Colson 1962, Berry 1993, Shipton and Goheen 1992; see Ch. 2, Section 2.5). It is intended to be more restricted than that: still concerned with testing economic models, it is merely substituting self-reported perceptions regarding tenure for self-reported objective facts related thereto. Subjectivity is an implicit plank of the neo-classical model. There is admittedly a risk of over-simplification in the process of reducing subjective reports to analysable data. Survey data such as these are no substitute for full-blown qualitative or ethnographic studies for understanding the multiple meanings of land. Yet since the data exist, it is worth testing them in the quantitative context. Economic models that suggest material effects of tenure security are not incompatible with approaches that centre on social relations; they are merely likely to over-simplify such approaches.

The questionnaire included the following questions that may be relevant to perceived tenure security:

1. Who has final authority over your land?
2. When you are deciding whether to make long-term investments on the land, like planting trees or practising soil conservation, do you consider your land tenure status?
3. Does the lack of title discourage you from making fixed investments?
4. Do you feel confident that you can keep your parcels as long as you want?
5. Do you want to change anything about your tenure status?
6. If yes, what do you want?
7. Do you think others would be jealous if you make fixed investments?
8. Do you think others would try to claim your land if you had fixed investments?
9. Have you ever had to leave a parcel or field?
10. Have you ever been in a dispute about land?
11. Do you think that others may try to claim your land?
12. Do you think the claim is likely to succeed?

Of these, most showed no significant difference in median aggregate fixed investment. (For some variables, this may be due to low frequencies in one response category.) However, certain of these perception-related variables did yield significant differences in medians.

5.2.5.1 *Who has final authority over your land?*

In the following comparison, the grouping variable is responses to the question “Who has final authority over your land?” Table 5.11 shows the frequencies of responses:

Table 5.11: Frequencies of responses to “Who has final authority over your land?” and median fixed investment per response category

	Frequency	Percent	Median fixed investment (constant Kw)
HHH him/herself	120	45.1	236,506
HHH's mother's family	5	1.9	96,528
HHH's father's family	21	7.9	39,029
HHH's headman	50	18.8	85,259
HHH's chief	18	6.8	17,930
Settlement scheme management	2	.8	370,343
National government/Min of Lands	26	9.8	97,505
other	3	1.1	163
HHH's relative who holds lease/title	12	4.5	774
HHH's in-laws	3	1.1	15,815
Total	260	97.7	
Missing	6	2.3	
Total	266	100.0	

‘HHH him/herself’ and ‘settlement scheme management’ each stand out from the rest. The category of those who responded ‘settlement scheme management’ had only two cases, so it is not likely to count for much in a median test. The median test between that of cases who responded ‘HHH him/herself’ and that of all other cases combined finds a significant difference (chi-square = 18.876, $p < 0.01$), as does a median test when all categories are kept separate.

What is the association between secure documentation and perception of having final authority over one’s land? Table 5.12 shows that a majority of title-holders, lease-holders, and relatives of title-holders perceive themselves to have final authority; whereas in the other categories only a minority express this. On customary land, a majority consider the headman or chief to have it. (Headmen are often relatives, hence this can mean conceding authority to one’s broader family.)

Table 5.12: “Who has final authority over your land?” cross-tabulated with Land Documentation Category

Count		Land Documentation Category						Total
		no doc, customary land	no doc, State land	HHH's relative holds lease	HHH's relative holds title	HHH holds lease in own name	HHH holds title in own name	
Who has final authority over your land?	HHH him/herself	22	17	7	10	32	32	120
	HHH's mother's family	1	1	1	1	1		5
	HHH's father's family	14	3	1	2	1		21
	HHH's headman	47	3					50
	HHH's chief	15	3					18
	Settlement scheme management		2					2
	National government/Min of Lands	1	11	2	1	7	4	26
	other		1				2	3
	HHH's relative who holds lease/title		2	7	3			12
	HHH's in-laws	1		2				3
Total		101	43	20	17	41	38	260

If the median test is repeated excluding cases on State land, 64% of those who respond ‘HHH him/herself’ are above the median, compared with 44% (35/79) of the rest. However, this result narrowly misses significance at 10% (chi-square = 2.575, $p = 0.109$). There is therefore no strong evidence that on customary land, believing that one has final authority over one’s land is associated with greater fixed investment.

5.2.5.2 *Do you consider tenure status when deciding on fixed investments?*

Another significant result is obtained using a grouping variable based on responses to the question “When you are deciding whether to make long-term investments on the land, like planting trees or practising soil conservation, do you consider your land tenure status?” 55% responded in the affirmative, that they do take tenure status into account when deciding on fixed investments (as reported above in Section 5.2). The medians between ‘yes’ and ‘no’ respondents differ sharply: Kw 23,651 among those who responded ‘no,’ versus Kw 549,482 for the ‘yes’ respondents. The median test is highly significant (chi-square = 17.931, $p < 0.01$). By a wide margin then, those who responded affirmatively—that tenure status is a consideration in the question of whether to make fixed investments—had greater median investment than those who did not.

A cross-tabulation between responses to this question and secure documentation category shows that most of the ‘yes’ responses (50/72, or 69%) came from households where the HHH holds a lease or title (i.e. on State land), and most ‘no’ responses (45/58, or 78%) came from customary land. So far then, this analysis therefore to a large extent merely parallels the already-established superiority in fixed investment of households on State land. However, partial correlation analysis shows that the correlation holds when State vs. customary is controlled for (though with slightly less magnitude: $r = -0.2433$, $p < 0.01$, compared to the zero-order coefficient of $r = -0.3984$). The null hypothesis is therefore rejected, and this analysis is taken as evidence that affirmative responses on whether tenure status is a consideration vis-à-vis investment are associated with higher levels of investment, even controlling for whether the respondent is on State or customary land.¹⁰⁴ By extension it also supports a hypothesis that tenure status does weigh on people’s decisions about whether to make fixed investments, especially for those who have already made considerable investment.

5.2.5.3 *Want to change tenure status?*

The questions were asked ‘Do you want to change anything about your tenure status?’ and ‘If so, what do you want?’ These were meant to be open-ended questions to elicit any sort of dissatisfaction. In the event, of the 148 (57%) who responded ‘yes,’ 137 (93%) responded to the subsequent question by saying they want a title. Table 5.13 cross-tabulates responses to the first question with land documentation category:

¹⁰⁴ As with the previous variable on final authority over one’s land, repeating the median test after excluding cases on State land still shows a higher median among the ‘yes’ respondents, but narrowly missing statistical significance (chi-square = 2.538, $p = 0.111$), possible because of small sample size.

Table 5.13: Land Documentation Category cross-tabulated with “Do you want to change anything about your tenure status?”

Count		Want to change anything about your tenure status?		Total
		yes	no	
SecDoc recode	no doc, customary land	48	52	100
#3 (order	no doc, State land	35	7	42
rearranged in	HHH's relative holds	21	1	22
accord with	lease	5	13	18
dummy	HHH's relative holds title	38	4	42
sequence)(copy)	HHH holds lease in own name	1	36	37
	HHH holds title in own name	148	113	261
Total ^a				

a. Total is less than full sample size of 266 because of missing values in some cases.

Those on customary land were almost evenly split between wanting a title and wanting no change. Most on State land, except for those who already have a title or whose relative holds a title, wanted a title.

Is there any relation between wanting or not wanting a change in tenure status and level of fixed investment? Excluding title-holders, those who responded that they want a change (i.e. a title) had greater median investment (Kw 112,721 vs. Kw 84,525) than those who do not. However this difference in medians does not achieve significance (chi-square = 2.395, $p = 0.122$).

To rule out any spurious effect of being on State settlement land, the median test is performed once more only on the sub-sample on customary land. The ‘yes’ respondents still have the greater median, but this too fails by a wide margin to achieve significance (chi-square = 0.037, $p = 0.848$). The null hypothesis is therefore not rejected, and although the sample (and selected sub-samples) contain differences in medians that suggest an association between wanting to change tenure status (among non-titleholders) and having greater fixed investment, this result is not generalisable to the population.

5.2.5.4 Claimed right to sell land

Respondents were asked if they had the right to sell their land without a chief’s permission. Table 5.14 cross-tabulates the responses with State or customary land:

Table 5.14: “HHH has right to sell land without chief’s permission?” cross-tabulated with State vs. Customary land

Count		Farm on State or customary land?		Total
		State land	Customary land	
HHH has right to sell land w/out chief's permission?	yes	48	8	56
	no	53	94	147
Total		101	102	203

Most positive responses were from households on State land; but a significant proportion (52.5%) of those on State land responded ‘no.’¹⁰⁵ This is a correct understanding of law before the 1995 Lands Act (which, as noted, had been legislatively approved but not yet implemented at the time of study): lease- or title-holders could not sell their land, with or without a chief’s permission. Inheritance is less of a problem: 97.4% on State land affirmed that their children could inherit the lease or title, including large majorities of respondents on land for which a relative held the lease or title.

Median aggregate fixed investment (by cost) is greater among ‘yes’ respondents by nearly three times (Kw 234,573, vs. Kw 84,525 among ‘no’ respondents). The median test is significant (chi-square = 6.266, $p = 0.012$). It is possible that this superiority is merely due to the already-established difference in investment between State and customary households. However a partial correlation analysis shows that the partial correlation coefficient (controlling for State vs. customary), although lesser in magnitude than the zero-order correlation (.2283, vs. .3037), is still highly significant ($p < 0.01$). The null hypothesis is therefore rejected, and this is taken as evidence that there is an association between perceived right to sell land without permission from chiefs and greater fixed investment, only partly due to being on State land.

A similar result is obtained in analysing responses to the question ‘Does the HHH have the right to register the land for title?’ Majorities on both State (81 per cent) and customary land (73 per cent) responded affirmatively. The ‘yes’ category has greater median fixed investment, and the median test is significant (chi-square = 4.790, $p = 0.029$).

¹⁰⁵The question was slightly problematic when posed to households on State land, because State land is statutorily not under any chieftdom. However it was felt that the question was worth asking, because in some settlements such as Mwanachingwala, the state had granted chiefs a role in selecting settlers. This, plus reports that some families acquired settlement parcels in one member’s name as a group investment (see Chapter 3, Section 3.3.3.6), could conceivably have resulted in lingering customary authority in these parts of State land.

5.2.5.5 *Experience of Disputes or Dispossession*

Several questions were asked regarding experience of land disputes or dispossession:

- Have you ever had to stop cultivating or leave any of your parcels or fields (including fields that you had before you came to this farm)?
- Why did you lose that parcel or field?
- Can you think of any other farmers in this village (or settlement), in the last five years, who have shifted off a piece of land they were farming, or lost a field?
- [IF YES] Why did that farmer (or farmers) leave the piece of land they were farming?
- Aside from what you answered to the previous question about whether you've ever had to leave a parcel of land, have you ever been involved in a land dispute?
- What kind of dispute?
- Do you think it is possible that others may try to claim ownership to your land?
- Do you think they'd be likely to succeed?

No significant differences in median fixed investment are found when cases are grouped by responses to any one of these questions. However, differences emerge when responses to these questions are combined into an index of experience with or exposure to land disputes or dispossession. Two indices are devised: the more general index records a 'yes' value when a respondent answered yes to any of the questions 12.1, 12.3, 12.5, or 12.11.¹⁰⁶ The second, more restrictive (less sensitive) index differs from the first in the following:

1. 'Yes' responses to 12.3 do not cause a 'yes' value for the second index. In other words, merely having heard of someone else moving off a parcel is not counted as experience of dispute or dispossession.
2. If the response to 12.7 is 'boundary dispute,' this returns a 'no' value for the second index. In other words, the land dispute must be of a more serious nature than a boundary disagreement to register in the second index.

¹⁰⁶ Except that cases with 'yes' responses to question 12.1 are not given a 'yes' value for the index if the response to the following question (12.2) indicates that the movement was voluntary (i.e., respondent moved to a bigger or better parcel). In other words the index does not register voluntary moves as being experience with dispute or dispossession. However it is interesting to note that the logic of tenure insecurity's disincentive for fixed investment holds even if the dispossession is voluntary and advantageous. A farmer who expects to move to a better parcel in a few years has the same disincentive for fixed investment as one who fears involuntary dispossession, assuming that in neither case is the farmer compensated for unexhausted improvements.

The first, sensitive index therefore represents any exposure, including indirect, with any land dispute (including minor ones) or dispossession. The second, restrictive (less sensitive) index represents direct experience of serious dispute or involuntary dispossession.

By the sensitive index, 48 per cent on customary land register positively, vs. 44 per cent on State land. By the restrictive index, 16 percent register positively on customary land, vs. 12 per cent on State land. By both measures, there is therefore little difference in experience of dispute or dispossession between State and customary land.

Is there a difference in fixed investments among those who register as having been exposed to dispute or dispossession? Median investment (cost) among ‘no’ respondents is Kw 104,625; among ‘yes’ respondents it is Kw 129,937. This seems counter-intuitive: those who have exposure (most broadly defined) to dispute or dispossession have greater median investment. However the median test is not significant (chi-square = 1.152, $p = 0.283$). Within the sample, it may be that greater investment attracts disputes, rather than experience of disputes discouraging investment.

Checking for differences in median investment vis-à-vis the restrictive index (which registers only serious disputes and involuntary dispossession) yields a difference in medians that is quantitatively small (Kw 129,000 vs. Kw 129,693) and statistically insignificant (chi-square = .254, $p = 0.614$).

If the customary stratum only is included, the ‘yes’ category (in each index) still has the greater median investment, by Kw 130,467 to Kw 84,525 in the restrictive index, and Kw 130,630 to Kw 29,691 in the sensitive index. However the median test is significant only with the sensitive index (chi-square = 4.236, $p = 0.040$); it misses by a wide margin with the restrictive index (chi-square = .450, $p = 0.502$).

These analyses therefore have found no evidence that experience of disputes or dispossession, defined broadly or narrowly, is associated with lower levels of fixed investment, as would be the case if such experience discouraged investment. Indeed the opposite is indicated in certain analyses: experience of dispute or dispossession is associated with higher median investment, though the association loses significance as the index of exposure to dispute becomes more restrictive. Three mechanisms can be imagined for this association:

1. Disputes encourage investment as way of strengthening claims;
2. High fixed investment attracts disputes;
3. Propensity to invest coincides with propensity to get into disputes.

There is little in the quantitative data to test any of these proposed mechanisms, and they are not mutually exclusive. There is however another way of using the dispute data, which is to test its association with land tenure categories, and so identify which have the least security. Do disputes and/or dispossession occur more in certain documentation categories than in others (Table 5.15), or certain categories of mode of acquisition?

Table 5.15: General experience with dispute / dispossession cross-tabulated with Land Documentation Category

			Less sensitive index of experience of dispute		Total
			no	yes	
Land Documentation Category	no doc, customary land	Count %	87 84.5%	16 15.5%	103 100.0%
	no doc, State land	Count %	34 79.1%	9 20.9%	43 100.0%
	HHH's relative holds lease	Count %	19 86.4%	3 13.6%	22 100.0%
	HHH holds lease	Count %	37 88.1%	5 11.9%	42 100.0%
	HHH's relative holds title	Count %	16 88.9%	2 11.1%	18 100.0%
	HHH holds title	Count %	37 97.4%	1 2.6%	38 100.0%
Total		Count %	230 86.5%	36 13.5%	266 100.0%

The table shows that most documentation categories appear to have similar percentages of 'yes' scores in the less sensitive (restrictive) dispute index, aside from the titleholder category which has a dramatically lower proportion of 'yes' scores. 'No doc, State land' has the highest proportion of 'yes' scores, with 20.9%.¹⁰⁷

These indices of exposure to dispute or dispossession are imperfect in the sense that they do not directly measure how the respondent feels about her current parcel, where her fixed investments are also measured. A respondent could have previously occupied a parcel under poor tenure security, experienced dispossession, and now managed to secure tenure and make investments on her current parcel. This indices of exposure to dispute therefore do not directly measure insecurity on the parcels for which fixed investment is measured; other questionnaire items cover this, such as "Do you think it is possible that others may try to claim ownership to your land?" These indices instead test whether history of exposure to dispute is associated

¹⁰⁷ Cross-tabulating with 'mode of acquisition' instead of documentation category (table not displayed) shows some slight differences among the categories, but the frequencies are too low (especially in the 'yes' column) to confidently discern patterns.

with investment behaviour, for example by producing an aversion to fixed investment. In any case, the bulk of evidence suggests that such history is not associated with low investment on current parcel; in fact the opposite is indicated.

5.2.5.6 Conclusions on Effect of Perceived Tenure Security on Fixed Investments

To recap this section on associations between reported perceived tenure security and levels of fixed investment: regarding disputes, there are few obvious patterns in the occurrence of serious disputes or involuntary dispossession among land tenure categories. Title-holders have a somewhat lower rate of self-reported insecurity, and those without document on State land have the highest, but these differences are too slight for statistical significance. In turn, there is no evidence that exposure to disputes is associated with lower investment levels; in fact some evidence runs the other way. Other expressions of perceived security or insecurity (having final authority over one's land, wanting to obtain a title, claiming right to sell or to register) are however associated with differential investment levels in the expected direction.

On a methodological note, it is pertinent to reiterate that these results are accompanied by negative or insignificant findings with several other questionnaire items relevant to perceived tenure security. This may be interpreted as weakening the result, but a more salient point may be that to measure something as intangible as perceived tenure security, many complementary formulations of questioning must be devised.

5.3 Case Studies of High- and Low-Investment Households

To paint a more holistic picture of the interactions among tenure security, fixed investments, farming performance, and socio-economic attributes, this chapter concludes by presenting summary case studies of households at the upper and lower end of the investment scores. Four cases were selected randomly from each of the upper and lower quintiles of fixed investment (aggregated by cost). All of the randomly selected upper-quintile cases are on State land, because investment levels are generally higher on State land. To compensate, studies of the highest-investment and highest-income households drawn from only the customary sub-sample are also presented, to suggest the circumstances that can surround such outcomes under customary tenure.

5.3.1 Highest Quintile of Fixed Investment

(The highest quintile has a range of aggregate investment from Kw 698,196 to Kw 14,480,878.)

Case no. 0726pm04: Mbaya settlement (Mazabuka District). The HHH is a 64-year-old male, married, with 13 children of whom 7 are living elsewhere; 5 other children are also living in the household. One of his grown children is a salaried worker. The HHH had no schooling (no grade completed); his father also had no schooling. The HHH farmed on traditional lands in the same district before coming to the settlement. He acquired the 14-year leasehold (in his own name) in 1971, and has not renewed it. In 2000/2001, the household planted 0.63 ha with local maize (22% of total planted hectareage), harvesting 2,268 kg (yield = 3600 kg per ha); also planted 1 ha with cotton (35% of total planted ha); 1 ha of groundnuts; 0.25 ha sunflower; no hybrid maize. Total area cultivated 2000/2001 was 2.88 ha; total parcel size is 40 ha. Regarding credit, in the last five years he has borrowed cotton seed and other materials once (2000/01), from an out-grower scheme. He applied fertiliser to crops this year, but did not recall the amount. He used his own animal traction, and did not hire temporary farm labour. He has never had to leave a parcel, nor ever had a land dispute. He has seven head of cattle, down from 76 in 1998. Reports no other income. For fixed investments, has one well, four planted trees, and six burnt-brick houses; total estimated cost Kw 1,143,626. Household income for the 12 months ended July 2001 is calculated as Kw 3,746,800 (nominal 2001 kwacha), entirely from crop production (half of whose value was comprised by cotton).

0716pm02: Silwiili B settlement (Monze District). 70-year-old male; married; has 5 children (all moved away) plus 6 other children who are living in the household; total household size is 9. One of his grown children is a civil servant, another a salaried worker; two are full-time farmers. The HHH completed grade 4; his father had had no schooling. The HHH farmed on traditional lands in the same district before coming to the settlement. He acquired the land in 1973 under leasehold, and obtained title (in his own name) in 1983. In 2000/2001, the household planted 2 ha with hybrid maize (42% of total planted hectareage), harvesting 7,200 kg (yield = 3600 kg per ha); also planted 0.25 ha with cotton (5% of total); 2 ha of groundnuts (42% of total); and 0.5 ha cowpeas. Total field area cultivated 2000/2001 was 4.75 ha. Rape and cabbage were also grown, with sales worth Kw 300,000. He has had one loan in the last five years, namely the current year, of 800 kg fertiliser, from a non-governmental organisation (NGO). He used his own animal traction, and hired temporary farm labour for harvest (42 person-days, at a cost of Kw 110,000). He has never had to leave a parcel, nor ever had a land dispute. He has 31 cattle, generating revenue of Kw 2,200,000 over the past year; reports no other income. For fixed investments, the household has one well, 300 meters of drainage canal, and a dam; total estimated cost Kw 2,709,179. (All of the fixed investments were installed before obtaining title.) Household income is calculated as Kw 4,071,800 (nominal 2001 kwacha), of which just over half was from cattle, and the rest from crops.

0720cn02: Kayuni West settlement (Monze District). The HHH is an 80-year-old male, married, with 10 children (of which 6 have moved away) plus 3 other children who are living in the household; total household size is 26. His children are full-time farmers; none are salaried. The HHH completed grade 4; his father was a smallholder farmer in another district. The HHH was a salaried worker before coming to the settlement; he also farmed on customary land. He acquired the land in 1979 under leasehold, and obtained title (in his own name) in 1988. In 2000/2001, they planted 7 ha with hybrid maize (52% of total planted hectareage), harvesting 18,900 kg (yield = 2700 kg per ha); also planted 2 ha of groundnuts, 4 ha sunflower, and 0.5 ha sweet potatoes. Total field area cultivated 2000/2001 was 13.50 ha. Tomato, onion and cabbage were also grown, with sales of Kw 250,000. He has had one loan in the last five years, namely the current year, of 400 kg fertiliser, from FRA (Food Reserve Agency¹⁰⁸). He used his own animal traction this year, and did not hire temporary farm labour. He has never had to leave a parcel, never had a land dispute. He has 6 cattle, down from 41 in 1998; 8 goats (with revenue of Kw 100,000 in the past year) and 30 poultry (Kw 200,000). He reports off-farm income from a kiosk (amount not specified). For fixed investments, he has one well, 1500 meters of fencing, one planted tree, and three burnt-brick houses; total estimated cost Kw 769,602. (Only the well was installed before obtaining title.) Total parcel size is 200 ha. Household income is Kw 5,401,864 (nominal 2001 kwacha, excluding the unspecified kiosk revenue), most of which consists of the value of the maize crop (of which he sold 2,700 kg for Kw 720,000 by the time of the interview). He comments that he wants loans to buy livestock; complains that loans for short-term inputs do not arrive on time for planting.

0721nh01: Tundwe settlement (Mazabuka District). The HHH is an 83-year-old male, married, with 12 children (of whom 8 have moved away) plus 8 other children who are living in the household; total household size is 24. Among his children are a full-time farmer, a civil servant, and a salaried worker. The HHH completed grade 6; his father was a smallholder farmer with 4 ha in the same district. The HHH had no previous work before farming this parcel. He inherited the land in 1948 from his parents, and obtained lease (in his own name) in 1979. In 2000/2001, they planted 3 ha with local maize (50% of total planted hectareage), harvesting 7,200 kg (yield = 2400 kg per ha); also planted 2 ha of groundnuts and 1 ha sweet potatoes. Total field area cultivated 2000/2001 was 6 ha. Tomato, rape and cabbage were also grown, none sold. He has had two loans in the last five years, namely the current and previous years, of 800 kg fertiliser each year, from FRA. He used his own animal traction this year, and hired temporary farm labour for weeding (140 person-days). He has never had to leave a parcel; reports having had a land dispute in 1976 over rights to perennial tree crops, with his

¹⁰⁸ Food Reserve Agency, a national government agency established to maintain a buffer stock of maize, which has become involved in credit to maize producers and marketing. See Ch. 6, Section 6.2.1 for further details.

mother's relatives; the chief settled the dispute. He has 4 cattle (down from 28 in 1998), along with 10 goats (with revenue of Kw 150,000 on past year) and 150 poultry (Kw 200,000). He reports no other income. For fixed investments, he has 30 planted trees and a borehole (just installed in 2001); total estimated cost Kw 4,323,744. (There are also four burnt-brick houses built in 1956, though in this study only improvements installed since 1975 are counted towards total investment cost.) Total parcel size is 6 ha. Household income is Kw 1,081,881 (nominal 2001 kwacha), half from livestock revenues and half from crop value (though he had not sold the current maize harvest yet). He comments that he is trying to get title, but the case is held up in court; it is unclear whether the land is State or customary.¹⁰⁹ His sons are cultivating the fields.

COMMENTS: There are few common threads among these cases except that they are all lease- or title-holders on State land (hence large farm size). Some have diversified sources of income (farm and off-farm), but one obtained most income from maize (no. 0720cn02, though if his kiosk revenue were reported it might outweigh the maize crop's value). The investments that put these cases into the upper quintile vary from those that can transform farming (the borehole and dam) to less dramatic assemblies of fencing, wells, and houses.

5.3.2 Lowest Quintile of Fixed Investment

(Aggregate investment in the lowest quintile ranges from Kw 0 to Kw 244.)

0706th01: Munamwala village, customary land (Monze District). The HHH is a 73-year-old male, married, with 6 children (of whom all have moved away) plus 6 other children who are living in the household; total household size is 9. Among his children are two civil servants, another salaried worker, and one in business. The HHH completed grade 7; his father had 9 ha of land. The HHH was a civil servant before coming to this parcel. He inherited the land in 1968 from his parents, and holds no land document. In 2000/2001, they planted 3 ha with local maize (88% of total planted hectareage), harvesting 3,000 kg (yield = 1000 kg per ha); also planted 0.4 ha of groundnuts. Total field area cultivated 2000/2001 was 3.4 ha. He has had one loan in the last five years, namely the previous year, of 400 kg fertiliser, from an unspecified agricultural financial agency. He used no fertiliser in the current year. He used his own animal traction, and hired temporary farm labour for weeding (24 person-days, paying total Kw 19,800). He has never had to leave a parcel; reports no experience of land disputes. He reports no other income, and no fixed investments. Total parcel size is 9 ha. Household

¹⁰⁹ Tundwe settlement generally is in the throes of a dispute: one settlement farmer apparently obtained title for the whole settlement scheme, which the others are disputing.

income is Kw 1,048,200 (nominal 2001 kwacha), mostly from the value of the (unsold) maize crop. He comments that he borrows fertiliser only if he has no manure to use instead.

0714ah03: Chawama (Monze District). Squatter on land along railway (adjacent to Silwiili Settlement) which officially belongs to parastatal railway company (State land). The HHH is a 30-year-old female, married, with one female and two male children under 14 years old; total household size is 4. The HHH completed grade 7; her father completed grade 4 and had 1 ha of land, as well as doing agricultural piecemeal. The HHH previously worked in business. She acquired the land in 2000 from her husband's parents, and holds no land document. In 2000/2001, she planted 0.75 ha with local maize (100% of total planted hectareage), harvesting 20.25 kg (yield = 27 kg per ha). She has had no loans in the last five years; used no fertiliser this year. She hired animal traction this year, and did not hire temporary farm labour. She has never had to leave a parcel; reports no experience of land disputes. She has no cattle; reports income from selling other livestock (Kw 250,000). No fixed investments. Total parcel size 1 ha; also has another field on land belonging to railway. Household income is Kw 254,800 (nominal 2001 kwacha), nearly all from the livestock sales. She comments that "We are living on land near the road¹¹⁰ thus we are not secure enough to put a lot of fixed improvements."

0724pm05: Ngwezi C settlement (Mazabuka District). The HHH is a 26-year-old male, married, with 4 children; total household size is 6. The HHH completed grade 10, and previously farmed another parcel in this settlement. He acquired the land in 1995, invited to share by his uncle (who holds the lease to the settlement parcel); he plans to shift if he can find his own land. In 2000/2001, he planted 0.5 ha with local maize (50% of total planted hectareage), harvesting 7,200 kg (yield = 3600 kg per ha); also planted 0.25 ha of groundnuts and 0.25 ha of cotton. Total field area cultivated 2000/2001 was 1 ha. He has had no loans in the last five years; used no fertiliser in current year; borrowed animal traction; did not hire temporary farm labour. Reports no experience of forced dispossession or land disputes. No cattle (nor any in 1998); reports no other income; no fixed investments. Total parcel size is 5 ha. Household income is Kw 2,322,000 (nominal 2001 kwacha), of which Kw 1,710,000 came from sale of the cotton crop (1800 kg), and most of the remainder came from the value of the local maize crop.

0728ah01: Magoye A settlement (Mazabuka District). The HHH is a 58-year-old male, married, with 14 children of his own (of whom all but 2 are still living in the household), plus 6 other children living in the household; total household size is 29. His children are full-time farmers. The HHH completed grade 7; his father was a farmer with 150 ha in the same

¹¹⁰ Her parcel is in the strip of land between the railroad and tarmac road.

district. The HHH previously farmed on customary lands in the same district. He acquired the land in 1987, as an *inter vivos* transfer from his parents; he obtained title in his own name in 1991. In 2000/2001, they planted 1 ha with hybrid maize (32% of total planted hectareage), harvesting 1,080 kg; also planted 1.5 ha of local maize (48% of total planted hectareage), harvesting 720 kg (yield = 480 kg per ha), 0.38 ha of cotton (12%) and 0.25 ha of groundnuts. Total field area cultivated 2000/2001 was 3.13 ha. Has had two loans in the last five years: the current year (200 kg of fertiliser, from FRA, with cash deposit as collateral) and the previous year (same). He hired animal traction; did not hire farm labour. Reports no experience of forced dispossession or land disputes. No cattle (nor any in 1998); has one goat and 13 poultry. Reports income from a shop (Kw 1,800,000 over past year). For fixed investments, reports only three planted trees (estimated cost Kw 81). Total parcel size is 5 ha. Household income is Kw 2,084,492 (nominal 2001 kwacha), of which most came from the shop. He comments that he is “not willing to risk title to get loans.”

COMMENTS: Again, there are few commonalities. State and customary land are represented, even including a titleholder. A possibly salient point is that only one of the four cases had any cattle.

5.3.3 Cases of High Investment and Income on Customary Lands

Since all of the high-investment cases randomly selected for description were on State settlements, for contrast we present studies of the two highest-income and two highest-investment cases on customary land.

5.3.3.1 High Income / Customary Land

0725ah02: Mwiingasompa (Mazabuka District). The HHH is a 32-year-old male, married, with 8 children of his own; total household size is 13. The HHH completed grade 5; his father was a smallholder farmer with 4 ha. The HHH has had no other full-time work aside from farming this parcel. He acquired one field (4 ha, at a distance of 0.9km from the house) in 2000, by purchase; acquired the other field (1 ha, next to house) in 1985 as an *inter vivos* transfer from his parents. He holds no land document. In 2000/2001, the household planted 8 ha with hybrid maize (80% of total planted hectareage), harvesting 12,240 kg (yield = 1530 kg per ha); also planted 2 ha of groundnuts. Total field area cultivated 2000/2001 was 10 ha. He has had three loans in the last five years: the current year (6,400 kg of fertiliser, from FRA, with cash deposit as collateral); the previous year (1,600 kg fertiliser, from FRA); and 1998/99 (1600 kg fertiliser, from an NGO, no collateral). He used his own animal traction; did not hire farm labour. Reports no experience of forced dispossession or land disputes. Reports income

from selling livestock (Kw 25,200,000), fish (Kw 56,000), and used clothes (Kw 8,400,000) over previous 12 months. For fixed investments, reports only nine planted trees (estimated cost Kw 489). Total farm size 5 ha (he apparently also borrowed some land this year, as total cultivated area was 10 ha). Household income is Kw 28,376,754 (nominal 2001 kwacha), of which most came from selling livestock, fish and used clothes (outweighing the huge maize harvest).¹¹¹ He comments that he could not acquire more land because of jealousy from those who have unploughed fields.

COMMENTS: This case is exceptional in several ways: the large area cultivated (by customary standards), the acquisition by purchase of a customary parcel, the access to huge fertiliser loans, the major income from livestock and clothing trade; all this at a relatively young age, with little education or fixed investments.

0719nh02: Kupuluka / Namilongwe customary (Monze District). The HHH is a 30-year-old male, married, with 3 children of his own, plus 3 other children living in the household; total household size is 8. The HHH completed grade 12; his father completed grade 7 and did non-agricultural casual labour, and also had 75 ha in the same district. The HHH was a salaried worker before farming this parcel. He acquired the land in 1999, inherited from parents with headman's approval; he holds no land document. In 2000/2001, they planted 3 ha with hybrid maize (67% of total planted hectareage), harvesting 7,200 kg (yield = 2400 kg per ha); also planted 1 ha of groundnuts and 0.5 of cowpeas. Total field area cultivated 2000/2001 was 4.5 ha. He has had two loans in the last five years: the current year (200 kg of fertiliser, from the co-operative, with farm equipment as collateral), and the previous year (400 kg fertiliser, same). He applied a total of 1,200 kg of fertiliser this year; borrowed animal traction; hired temporary farm labour for weeding and harvesting (55 person-days, total cost Kw 197,500). Reports having had to leave a parcel previously because his mother's family re-allocated it to someone else; no other experience of forced dispossession or land disputes. He wants a title so as to be able to bequeath, but says the headman (who allocated him this land) would not accept it. For livestock, has one pig and 40 poultry (the latter bringing Kw 200,000 revenue in previous 12 months). Reports income from ongoing salaried work (Kw 1,920,000) and various small enterprises and sales (Kw 10,179,000) over previous 12 months. For fixed investments, reports one well, 200 planted trees, and two burnt-brick houses (estimated total cost Kw 177,577). Total parcel size is 30 ha. Household income Kw is 12,040,900 (nominal 2001 kwacha), of which most came from the various small enterprises. He comments that he

¹¹¹ The calculated household income is less than the sum of the sales revenue because of cost of fertiliser and seed.

has other fields—about 5 ha—in Hatontola (also Monze District) where his parents live, though other relatives have some authority over that land.

COMMENTS: Again, there is exceptional farm size by customary standards (30 ha), though the cultivated area is less unusual (4.5 ha). Fertiliser borrowing again is prodigious, as is off-farm income.

5.3.3.2 *High Investment / Customary Land*

0705cn01: Sikabali customary (Monze). The HHH is 45-year-old male, married, with 5 children of his own, plus 4 other children living in the household; total household size is 11. The HHH completed grade 12; his father had 15 ha in the same district. The HHH was in business / trade before farming this parcel; had land on a State settlement scheme. He acquired the current land in 1992, allocated by the headman; holds no document. In 2000/2001, they planted 3 ha with hybrid maize (89% of total planted hectareage), harvesting 11,700 kg (yield = 3900 kg per ha); also planted 0.1 ha of groundnuts, 0.1 ha of beans, and 0.16 ha of sweet potatoes. Total field area cultivated 2000/2001 was 3.36 ha. He has had no loans in the last five years; used no fertiliser this year; used his own animal traction; and hired temporary farm labour for weeding and harvesting (146 person-days, total cost Kw 163,350). Reports no experience of having had to leave a parcel; had a dispute in 1991 with another community member over grazing rights, settled by the headman. He does not want any change in tenure status. For livestock, he has 22 cattle (down from 38 in 1998), with revenue over previous year of Kw 4,250,000¹¹²; also seven goats (revenue of Kw 40,000) and 15 poultry (no revenue). Reports no other income. For fixed investments, reports one well, 840 metres of fencing, and one burnt-brick house (reported / estimated total cost Kw 4,285,359); also contour-ridging of 2 ha. Total parcel size 4 ha. Household income is Kw 7,053,020 (nominal 2001 kwacha), of which most came from cattle revenue and maize production. The HHH is a District Councillor (elected local government position), though he did not mention a salary. He managed to get a borehole drilled on his land by UNICEF (which was operating a community water supply programme in the district) at no cost to himself.¹¹³

0712cn02: Michelo customary (Monze). The HHH is a 40-year-old female, widowed, with 8 children of her own (three of whom are living elsewhere); total household size is 6. The HHH completed grade 9; her husband had completed grade 7. Her father had completed grade 7; he was a farmer, with 12 ha in the same village. The HHH has had no other work aside from farming this parcel. She acquired the land in 1995, as an *inter vivos* transfer from her relatives;

¹¹² May include sales, slaughter, hiring out, or dairy.

¹¹³ Because it cost him nothing, it is not counted towards his total fixed investment score; he is nonetheless already in the highest quintile without it, and has the highest score on customary land.

she holds no land document. In 2000/2001, they planted 3 ha with hybrid maize (38% of total planted hectareage), harvesting 1,350 kg (yield = 450 kg per ha); also planted 2 ha of cotton (25% of total ha), 1 ha of groundnuts, and 2 ha of sweet potatoes. Total field area cultivated 2000/2001 was 8 ha. She has had one loan in the last five years, namely the previous year (200 kg fertiliser, from the co-operative). She used no fertiliser this year; borrowed animal traction; did not hire temporary farm labour. She reports no experience of disputes or having had to leave a parcel; does not want any change in tenure status (though she mentioned wanting to know more about titles). Reports no livestock, no other income. For fixed investments, she reports 840 metres of drainage, and one burnt-brick house (reported / estimated total cost Kw 1,775,025); also 3 pot-holed hectares. Total parcel size is 3 ha, though she managed to borrow 5 additional ha for the current farming year. Household income is Kw 717,050 (nominal 2001 kwacha), all from value of crops.

COMMENTS: Exceptional features in the first case include the HHH's political office and the fact that he gave up State land to acquire his current customary parcel, which now boasts a free borehole among other improvements. The second case is exceptional in acquiring land as a widow (plus borrowing more) and managing to install fairly significant investments.

5.3.4 Conclusions on Case Studies of High- and Low-Investment Households

The lack of obvious commonalities in this assembly of cases suggests diversity of farming strategies, sources of income, and determinants of fixed investment and other outcomes. They are therefore useful in inspiring caution about statistical conclusions: these many exceptions hardly prove the rule. One phenomenon is that high-investment and high-income cases seem to have diversified sources of income (cattle, non-maize crops, off-farm); few seem to be earning high incomes just from maize. Cotton seems to be the important non-maize crop. Cattle ownership also appears in most high-income and high-investment cases. The cases on State land, both high- and low-investment, contain fairly typical profiles for that category of farmers, with few major surprises. By contrast, the high cases on customary land all contain some exceptional features (some, like widowhood, that might seem an impediment). This at least is consistent with the quantitative conclusions, that investment is generally higher on documented State land, and therefore high investment on customary land is likely to entail distinctive circumstances.

Chapter 6: RESULTS: LAND TENURE AND PRODUCTIVITY, CREDIT USE, INTER-GENERATIONAL TRENDS, ACCESS TO LAND, AND INCOME

6.1 Land Tenure and Productivity

The neo-classical model of the economic effects of tenure security predicts that it causes improved productivity at the farm or household level through the mechanisms of fixed investments and greater credit supply (resulting in greater use of inputs), and at the aggregate level through transfer of land to more efficient users. (See Chapter 2 for a thorough discussion of the merits of the model as applied to sub-Saharan Africa.) This chapter begins by exploring the causes of differential productivity at the household level, with particular attention to land tenure and its indirect effects as hypothesized in the neo-classical model.

In previous land tenure studies (e.g. most of those presented in Bruce and Migot-Adholla 1994), productivity is commonly measured with respect to land.¹¹⁴ Indeed, to the extent that land is a scarce input, maximizing its productivity is a prime concern. However, labour productivity should also be analysed, because it is possible that some households face more of a labour shortage than a land shortage.¹¹⁵ Also, factor substitutions are likely to be employed: a household with very little land in proportion to household size is likely to compensate for inadequate cultivated area by applying intensive, even inordinate labour inputs in order to boost production. This would result in relatively high yields (land productivity), but low labour productivity. Conversely, a household with extensive land but lesser household size is likely to achieve higher labour productivity but lesser land productivity. Considering the determinants of both land and labour productivity is therefore likely to enrich the conclusions.

¹¹⁴In which case, respecting a single crop like maize, it is called 'yield.' Yield is here defined as output (in kilograms) per unit of cultivated area (hectares). It is synonymous with the less concise term 'land productivity' and analogous to 'labour productivity' (output per unit labour).

¹¹⁵ During the course of the survey it became apparent that because of constraints on availability of purchased or borrowed inputs, labour, and livestock, much arable land is actually under-utilised in recent years: respondent households would often cultivate only a portion of their available hectareage. In this sample, even the smallest quintile of farm size had uncultivated portions, albeit small (mean 13 per cent); in the middle quintile a mean of 34 per cent of hectareage was uncultivated in the past season. See Section 6.4 below for further detail.

In addition to yields of individual crops (kg/ha), total crop value (nominal 2001 Kw) per unit land and labour is analysed, so as to be able to integrate data from the households who plant non-maize crops (e.g. cotton), as well as data on local and hybrid maize outputs.

Data for only the 2001 harvest were collected, although time series data would give much stronger indications of trends, being less influenced by annual vagaries of weather. Also, there are some potential influences on yields that were not measured in this survey: local rainfall, soil quality, seed quality, weeding quality, timeliness of planting and fertiliser application, etc.. For these reasons, regressions on productivity are likely to have relatively large error terms.

6.1.1 Differences in Productivity between State and Customary Land

To introduce the data and potential determinants, simple differences in productivity between State and customary land farms are presented first.

6.1.1.1 Maize

Yields for hybrid maize and local maize were measured separately, because hybrid maize is expected to out-produce local maize, all thing being equal. Medians are compared, as the means are skewed by some extreme high values.¹¹⁶

On customary land the median yield per hectare of *hybrid* maize was 1,125 kg ($n = 54$) ; on State land it was 1,620 kg ($n = 113$). However this considerable difference narrowly misses significance at 10% via the median test (chi-square = 2.563, $p = 0.109$). Median yield of *local* maize was 652.5 kg/ha on customary land ($n = 58$), vs. 900.0 kg/ha on State land ($n = 68$), an advantage of 37.9% for State land.¹¹⁷ This median test is significant (chi-square = 4.867, $p = 0.027$). The null hypothesis, that there is no difference beyond the sample in yields between State and customary land, is therefore rejected for local maize but not for hybrid maize.

6.1.1.2 Total crop value per hectare cultivated

Aggregating all crops by value, the median per ha on State land is convincingly higher (Kw 316,124, vs. Kw 222,300 on customary land). The median test is highly significant (chi-square = 9.902, $p < 0.01$).

¹¹⁶ Some reported yields equate to over 12,000 kg per hectare, whereas agronomic sources indicate that yields for hybrid maize in this zone are unlikely to be more than about 6,000 kg/ha. (GART, 2000: 33) Also, Bangwe (1997) found a mean maize yield (not distinguishing hybrid from local) of 1589 kg/ha, with a minimum of 126 kg/ha and maximum of 7920 kg/ha, from a small sample of 35 Monze households. Some of the self-reported figures therefore appear to be exaggerated (or the hectareage understated), making it safer to test medians rather than means.

¹¹⁷ The sum of the four n 's exceeds the total sample size of 266 because some farmers grow both hybrid and local maize.

Some of this difference is due to yield differences in maize (see Section 6.1.1.1 above), but does the greater value harvest per hectare on State land also reflect more extensive or more productive planting of higher-value crops? The commonest higher-value crops in the sample are cotton and sunflower. Median yields are higher on State land for both sunflower (360.0 kg/ha, vs. 258.3 kg/ha on customary, though the difference is insignificant) and cotton (1000.0 kg/ha, vs. 600 kg/ha on customary, significant at 5%). Also, many more State land farmers plant these crops (67 for sunflower, 60 for cotton) than do customary farmers (12 and 19).

The greater productivity of State land in terms of crop value per hectare therefore seems to be the result both of greater yields and of more State land farmers planting higher-value crops. In this vein it would be interesting to see the typical profile of crops for each stratum. To illustrate this, variables are introduced which reflect the proportion of total area planted (2000/2001 season) dedicated by the respondent household to a given crop. Table 6.1 summarises mean proportions for the main crops over the whole sample:

Table 6.1: Proportion per crop of total area cultivated 2000/01

Crop	N	Minimum	Maximum	Mean	Std. Deviation
Hybrid maize	266	.00	1.00	.355	.3253
Local maize	266	.00	1.00	.295	.3482
Sunflower	266	.00	.50	.057	.1033
Cotton	266	.00	.76	.093	.1640
Groundnut	266	.00	.67	.130	.1360
Sweet potatoes	266	.00	.67	.052	.0975

Under the columns for minimum and maximum, we see that some households cultivated exclusively hybrid maize or local maize, but the typical (mean) proportions in terms of cultivated hectareage were 35.5% and 29.5% respectively. (It was fairly common for households to cultivate some of both.) The remaining four common crops occupied much lesser proportions on average, though some households specialised in them.

The differences in mean proportions between State and customary (Table 6.2) are small in magnitude and statistically insignificant for sweet potatoes, groundnuts, and hybrid maize. Differences for the other crops were significant: customary households cultivated a greater proportion of local maize, and State households cultivated considerably greater proportions of sunflower and cotton.

Table 6.2: Difference in mean proportion per crop of total area cultivated (2000/01) between State and customary households

Crop	Farm on State or customary land?	N	Mean	Std. Deviation	Std. Error Mean
Hybrid maize	Customary land	103	.316	.3428	.0338
	State land	163	.379	.3123	.0245
Local maize	Customary land	103	.376	.3650	.0360
	State land	163	.244	.3281	.0257
Sunflower	Customary land	103	.018	.0584	.0058
	State land	163	.081	.1174	.0092
Cotton	Customary land	103	.065	.1528	.0151
	State land	163	.110	.1689	.0132
Groundnuts	Customary land	103	.135	.1504	.0148
	State land	163	.126	.1264	.0099
Sweet potatoes	Customary land	103	.060	.0979	.0096
	State land	163	.047	.0973	.0076

(Differences significant at 5% [$p < 0.05$] are in **bold**.)

Table 6.3 shows means of prices that respondents reported receiving for each crop in 2001:

Table 6.3: Mean prices received by respondents per crop in 2001

CROP	MEAN PRICE RECEIVED BY GROWER	N =
cotton	Kw 889 / kg	68
local maize	Kw 240 / kg	12
hybrid maize	Kw 247 / kg	35
sunflower	Kw 398 / kg	51
groundnuts	Kw 240 / kg	26
sweet potatoes	Kw 267 / kg	24

However, more relevant to this exploration as to why State households produce more value per hectare cultivated than customary households is the mean value per hectare of each crop. Table 6.4 shows each crop's mean price (measured at the above mean unit prices, nominal 2001 kwacha) divided by its mean yield:

Table 6.4: Mean crop value (nominal 2001 Kwacha) per hectare cultivated with that crop

Crop	N	Mean	Std. Deviation	Std. Error Mean
Maize (hybrid)	167	504,328	509,663	39,439
Maize (local)	126	308,516	363,346	32,369
Sunflower	81	273,620	478,131	53,126
Cotton	80	1,062,959	1,045,923	116,938

(Cost of inputs is not included in these variables; therefore they do not reflect profit per hectare. Each of these four means is significant [$p < 0.01$]).

We see that hybrid maize outperforms local maize in value per hectare; at almost the same sale price per kilo, this must be due to its stronger yields. Interestingly, sunflower is outperformed even by local maize, despite its frequently being touted as a cash crop. But cotton heavily outperforms the rest, producing on average nearly twice as much value per hectare as the closest competitor (hybrid maize).

These data are consistent with an explanation of State land's greater median crop value per hectare that points to greater use on State land of higher-value crops, as well as (with inconsistent significance) better maize yields. Although cultivating more sunflower turns out to be a disadvantage in value per hectare, State households' superiority in the other high-value-per-hectare crops (hybrid maize and cotton) gives them the overall advantage.

6.1.2 Full model of factors in maize yields and total crop value

As a prelude to testing a full model of factors in yields, we explore maize yields and total crop value expanding the State vs. customary land categories into the six land documentation categories (Table 6.5):

Table 6.5: Median yields (hybrid and local maize) and median total crop value per hectare, by land documentation category

Variable	Total	No doc., cust. land	No doc., state land	HHH's relative holds lease	HHH's relative holds title	HHH holds lease	HHH holds title
Hybrid maize yield (kg/ha), median	1,463	1,125	1,750	975	1,215	2,160	1,800
Local maize yield (kg/ha), median	720	653	619	525	1,170	1,058	900
Total crop value per hectare (median, nominal 2001 kwacha)	269,202	222,300	292,671	200,225	323,309	333,217	388,479

The medians vary considerably across categories. However, a median test for hybrid maize shows that its rather sharp differences across categories fail to attain significance (chi-square = 8.704, $p = 0.121$). A two-way median test between title-holders and customary farmers does confirm the significance of the higher median among titleholders (chi-square = 4.454, $p = 0.035$). With local maize, the median test is significant at 10% ($p = 0.056$). (A two-way median test on local maize yields between title-holders and customary land is insignificant.) Differences of total crop value per ha are significant at 1% (chi-square = 17.986, $p < 0.01$). Therefore among land documentation categories, not all distinctions in maize yields are sharp enough to be generalisable beyond the sample. Differences in total crop value per ha, however, are strongly significant.

6.1.2.1 *Land productivity for hybrid and local maize*

The full model will contain the land documentation categories as independent (dummy) variables, plus the usual set of socio-economic control variables, to identify the determinants of maize yields.¹¹⁸ Agronomic variables are also added: kg of fertiliser applied per ha of maize planted, kilos of maize seed per hectare of maize cultivated ('planting density' for short), and cattle ownership.¹¹⁹ Also, aggregate fixed investment (square-rooted) will be moved to the column of independent variables, as this may have a causal effect on yields (though, as discussed, fixed investments can have purposes other than boosting the production of annual crops). Credit use (total value of loans over the past five years) is also added.

First, the raw scores of hybrid maize yields (kg/ha) are transformed towards normality by square-rooting (as are the independent variables of total cattle ownership, credit use, fertiliser use, and fixed investments.)

The OLS regression (after excluding one case with an outlying residual) produces significant coefficients (see Table 6.6, Column 1) for planting density, cattle ownership, and fertiliser use (kg/ha). Their causal mechanisms seem clear, except perhaps that the strength of cattle's coefficient is surprising, considering that cattle's effect might have been expected to work via greater area cultivated, reduced labour input, or affording liquidity to allow fertiliser purchase or borrowing (all of which are controlled in the model). The likely explanation is the oft-reported importance of the timing of maize planting in Southern Province: the relatively short and often unreliable rainy season means that maize planted immediately after the first rain is likely to produce more. However, because of this short window of optimal planting (combined

¹¹⁸ Except that household income is not included in the regression, because it does not precede, and in this study is substantially derived from, crop yields.

¹¹⁹ 51.5% of the sample had zero cattle; 25% had between one and seven cattle, and the remaining 23.5% had more than seven (with four cases over 100, up to a maximum of 330).

Table 6.6 Regression results, determinants of hybrid and local maize yields

Independent Variables	Dependent Variable			
	1.		2.	
	Hybrid maize harvest (kg) per ha (square root)		Local maize harvest (kg) per ha (square root)	
	Coefficients		Coefficients	
	B	Beta	B	Beta
(Constant)	23.274 (3.37)		25.124 (3.92)	
No document / State land	3.618 (0.94)	0.073	-3.872 (-1.22)	-0.090
HHH's relative holds lease	-1.840 (-0.42)	-0.031	-3.796 (-0.87)	-0.066
HHH's relative holds title	-2.116 (-0.47)	-0.035	9.574 (1.53)	0.108
HHH holds lease	1.049 (0.28)	0.024	1.105 (0.25)	0.021
HHH holds title	-4.914 (-1.11)	-0.110	-1.038 (-0.24)	-0.018
HHH Age	0.098 (0.94)	0.091	-0.044 (-0.47)	-0.044
HH labour force	-0.230 (-0.91)	-0.087	-0.189 (-0.53)	-0.049
HHH's education	-0.056 (-0.12)	-0.010	-0.470 (-1.09)	-0.092
Parents' wealth index	-0.176 (-0.20)	-0.015	-0.107 (-0.13)	-0.010
Total Area (ha) cultivated 2000/01	0.041 (0.13)	0.013	-0.104 (-0.21)	-0.019
Years since farm acquisition	0.010 (0.07)	0.006	-0.077 (-0.62)	-0.058
Distance to market	-0.074 (-0.45)	-0.034	-0.155 (-0.86)	-0.065
Fertilizer use (total kg per ha ¹ 00/01) (sq.rt.)	0.023 (2.17)	0.193 **	0.550 (2.68)	0.275 ***
Number of cattle owned (sq.rt.)	2.429 (4.26)	0.387 ***	4.006 (3.27)	0.294 ***
Fixed investments (aggregate cost) (sq.rt.)	0.001 (0.45)	0.042	0.005 (1.93)	0.169 *
Credit use (total value of loans last 5 years) (sq.rt.)	-0.003 (-1.06)	-0.097	-0.006 (-1.35)	-0.146
Planting density (kg seed / ha)	0.490 (5.91)	0.431 ***	0.392 (7.11)	0.554 ***
Observations	151		108	
Adjusted R-square	0.355		0.526	

Note: Numbers in parentheses are *t*-values.

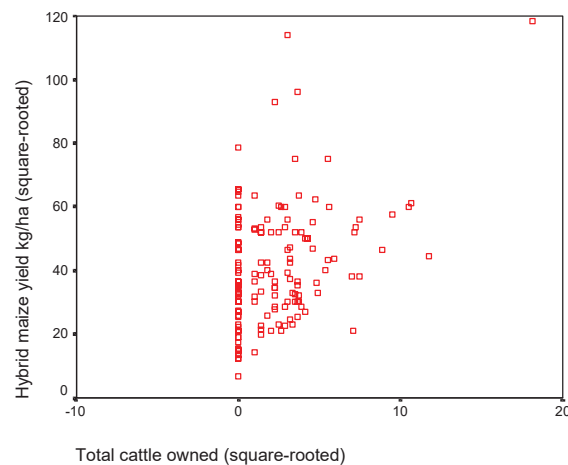
*Significant at 10%; **Significant at 5%; ***Significant at 1%.

B coefficient = unstandardised, *beta* coefficient = standardised.

¹ In Column 1 (hybrid maize), this is per ha cultivated with maize; in Column 2 it is per total ha cultivated. The latter was insignificant with hybrid maize.

with the fact that the ground is too hard to plough effectively before the rain), those with enough cattle to plough and plant quickly are likely to enjoy better yields. Manuring and more effective tillage with ox-drawn ploughs as opposed to hand-hoeing may also contribute to cattle's effect. The scatterplot (Figure 6.1) of cattle ownership against hybrid maize yields is fairly diagonal, tending to affirm the substance of the result. Some zero-cattle owners achieved moderately high yields, but the reverse is not true—almost no high-cattle households had low yields. Causality could also run in reverse: to the extent that maize yields in the 2000/01 season may indicate consistently more productive land, there is a likelihood of greater income over the years which could then have been used to accumulate cattle.

Figure 6.1: Scatterplot of Cattle Ownership vs. Hybrid Maize Yields



Some of the variables are interesting for their insignificance. That of 'Total area cultivated' means that, for hybrid maize, there is no inverse farm size / productivity ratio.¹²⁰ That of 'HH labour force' implies that greater household labour availability does not produce more hybrid maize per hectare. (A possible explanation is that greater HH labour force expresses itself as greater area under cultivation, thereby increasing overall harvests without increasing harvest per unit land.) That of 'HHH's education' indicates that whatever effect education has on yields is transmitted through other variables in the equation. (The bivariate scatterplot, not displayed, did not show any clear association.) That of aggregate fixed investments shows that the investments in themselves, apart from indirect effects through other variables in the equation, do not boost hybrid maize yields.¹²¹ Lastly, and interestingly on a methodological

¹²⁰ Bivariate correlation, without controls, between hybrid maize yield and total area cultivated (extremes excluded) is insignificant. That between local maize yield and total area cultivated is negative (Pearson $r = -.151$) and significant at 10% ($p = 0.091$), marginally supporting the inverse ratio for the case of local maize only.

¹²¹ There could of course be a sort of adverse selection at work: productivity-boosting fixed investments might only be worth installing on plots where the fertility or productivity is otherwise unacceptably low.

note, the insignificant results for land tenure categories implies that soil quality (fertility) on State land is not generally better than on customary land—which fulfils the purpose of choosing a geographically focused study area in order to hold soil quality constant between the two major sampling strata.

Determinants of local maize yields (Table 6.6, Column 2) are the same¹²² and have the same order of standardised (*beta*) coefficients, except that they are now joined by fixed investment (albeit with a weaker *beta* coefficient and significance). The adjusted R-squared is considerably higher in this regression (.526, vs. .355 in the regression for hybrid maize), which is consistent with a supposition that hybrid maize a more volatile crop than local maize, which locally has the reputation of being more impervious to vagaries of weather, soil quality, and fertiliser application.

The inverse farm size / productivity ratio also fails again to appear, as the coefficient for ‘total area cultivated’ is insignificant. Noteworthy as well was the lack of association of household labour force to local maize yields.

To recap: for both hybrid and local maize, planting density is the strongest determinant of yield per hectare. Cattle ownership has a positive association with both hybrid and local maize productivity, most likely be allowing more timely ploughing and planting. Fertiliser significantly affects both, though the result is sensitive to method with hybrid maize. Fixed investment correlates with local maize yields. Land documentation categories have no direct association with yields; nor do size of household labour force, HHH education, or the other control variables.

6.1.2.2 *Labour Productivity for hybrid and local maize*

Labour productivity would best be calculated with respect to actual labour inputs (e.g. work-hours). However, given that the questionnaire already pressed respondents for lengthy details on land tenure and fixed investments among other topics, the decision was made not to try to quantify labour input beyond counting working-age household residents and person-days of hired labour. The ‘farm labour force’ that forms the denominator of the calculated labour

¹²² However, a variation was used for the fertiliser variable. Variables were calculated for kg of fertiliser applied per hectares cultivated with maize, and per total hectares cultivated. Unexpectedly, the former was insignificant in the regression on hybrid maize. Either variable was significant with local maize. Mean fertiliser application per hectare of maize was 179 kg for hybrid maize farmers and 98 kg for local maize farmers; medians were 100 and 0 kg respectively, meaning that a majority of local maize farmers applied no fertiliser. This more extravagant use of fertiliser on hybrid maize may have contributed to this irregularity in its significance.

productivity is therefore to be understood as a proxy for actual labour input, and perhaps should be called ‘labour availability.’¹²³

Median labour productivities (hybrid maize, local maize, and total value) differ with respect to the land documentation categories (Table 6.7):

Table 6.7: Median production per farm labour force by Land Documentation Category

(Kg or Kw / farm labour force)

	Hybrid Maize (kg)		Local Maize (kg)		Total crop value (nominal 2001 Kw)	
	Median	<i>n</i> =	Median	<i>n</i> =	Median	<i>n</i> =
No doc, customary land	456.7	54	228.2	58	132,098	103
No doc, State land	771.4	25	157.0	22	230,400	43
HHH's relative holds lease	286.9	14	303.8	10	132,739	22
HHH holds lease	568.4	29	351.1	18	261,578	42
HHH's relative holds title	442.0	14	597.9	4	194,577	18
HHH holds title	885.7	31	291.1	14	307,213	38

The median test is significant in all three cases (hybrid maize $p < 0.01$; local maize $p = 0.043$; total crops value $p < 0.01$). We recall that the median test is among the least sensitive significance tests, i.e. less likely to confirm a true population difference; so its significant result here is convincing. Titleholders lead labour productivity in hybrid maize, followed (atypically) by ‘no document, State land’; customary land falls in the middle. For local maize, ‘HHH’s relative holds title’ leads (though with only four cases in the sub-sample), followed by ‘HHH holds lease,’ with customary land second to last. For total value per unit labour, ‘HHH holds title’ leads, followed by ‘HHH holds lease,’ with customary land in last place.

OLS regression is performed on hybrid and local maize outputs per unit farm labour (transformed towards normality by square-rooting). For hybrid maize (Table 6.8, Column 1), the independent variables with significant coefficients are: ‘HH labour force’ (negative), ‘total area cultivated,’ ‘cattle ownership,’ ‘fixed investments,’ ‘planting density,’ and ‘years since farm acquisition’ (negative, at 10%).

¹²³ Farm labour force equals household labour force (all household members aged 12-64) plus reported hired labour (pro-rated into person-years).

Table 6.8: Regression results, determinants of labour productivity for hybrid and local maize

Independent Variables	Dependent Variable			
	1.		2.	
	Hybrid maize harvest (kg) per unit farm labour force (square root)		Local maize harvest (kg) per unit farm labour force (square root)	
	Coefficients		Coefficients	
	B	Beta	B	Beta
(Constant)	18.411 (3.42)		17.971 (3.85)	
No document / State land	2.899 (0.94)	0.071	-3.915 (-1.66)	-0.144
HHH's relative holds lease	-3.162 (-0.90)	-0.065	-0.499 (-0.15)	-0.014
HHH's relative holds title	-3.194 (-0.88)	-0.064	12.939 (2.81)	0.231 ***
HHH holds lease	0.309 (0.10)	0.008	5.079 (1.57)	0.156
HHH holds title	-3.544 (-1.00)	-0.097	-3.206 (-1.03)	-0.092
HHH Age	0.068 (0.84)	0.078	0.057 (0.82)	0.092
HH labour force	-1.288 (-6.39)	-0.593 ***	-1.468 (-5.62)	-0.606 ***
HHH's education	-0.312 (-0.88)	-0.070	-0.137 (-0.43)	-0.043
Parents' wealth index	0.333 (-0.47)	0.034	0.395 (0.67)	0.058
Total Area (ha) cultivated 2000/01	1.301 (5.09)	0.499 ***	1.302 (3.58)	0.369 ***
Years since farm acquisition	-0.199 (-1.73)	-0.150 *	-0.081 (-0.89)	-0.097
Distance to market	0.137 (1.05)	0.076	-0.058 (-0.43)	-0.038
Fertilizer use (total kg per ha 00/01) (sq.rt.)	0.225 (1.28)	0.106	-0.080 (-0.37)	-0.045
Number of cattle owned (sq.rt.)	1.776 (3.84)	0.344 ***	2.808 (3.17)	0.337 ***
Fixed investments (aggregate cost) (sq.rt.)	0.004 (2.29)	0.208 **	0.003 (1.43)	0.146
Credit use (total value of loans last 5 years) (sq.rt.)	-0.001 (-0.68)	-0.058	-0.001 (-0.46)	-0.059
Planting density (kg seed / ha)	0.177 (2.68)	0.190 ***	0.060 (1.69)	0.158 *
Observations	152		109	
Adjusted R-square	0.380		0.344	

Note: Numbers in parentheses are *t*-values.

*Significant at 10%; **Significant at 5%; ***Significant at 1%.

B coefficient = unstandardised, *beta* coefficient = standardised.

To interpret: the strong negative coefficient for ‘HH labour force’ means, plausibly enough, that having fewer household members around is associated with more production per member (i.e. declining marginal labour productivity). ‘Cattle ownership’ continues its strong association with various measures of productivity. The significance of ‘fixed investments’ implies that some of those investments are labour-saving as regards hybrid maize growing.

The explanation for the strong positive coefficient for ‘total area cultivated’ is less obvious, particularly as ‘planting density’ is also significant in the model. It seems that larger farms manage more output per unit labour, even controlling for planting density, fertiliser use, and cattle ownership.

The insignificance of the coefficients for the land documentation categories show that the earlier significant differences in medians among land documentation categories are shown to be due to indirect effects,¹²⁴ causally transmitted through some of the six significant factors.

For local maize (Table 6.8, Column 2), fixed investment and years since acquisition drop from the list of significant correlates, and ‘HHH’s relative holds title’ becomes significant. (Table 6.7 showed that there are only four local maize growers among that category, so not too much substantive weight should be put on that variable’s statistical significance.) ‘HH labour force’ (negative), ‘total area cultivated,’ ‘cattle ownership,’ and ‘planting density’ remain significant.

To recap: fixed investments improve labour productivity significantly for hybrid maize, though not significantly so for local maize. Declining marginal productivity of labour is evident for both crops. Planting density is positively associated with labour productivity for both crops. Fertiliser use, surprisingly, is not. Cattle again strongly associate with greater labour productivity, and not merely via area cultivated (hence ploughed), which is controlled. Again, timing of ploughing and planting, manuring, and/or more effective tillage may be the mechanisms. Finally, the positive association between labour productivity and area cultivated also lacks an obvious explanation: it robustly survives when planting density, fertiliser use, and cattle ownership (the obvious potentially intervening variables) are controlled for. This means that one person cultivating two hectares of maize will produce more per hectare than one cultivating one hectare, even with the same seed planting density, fertiliser per hectare, and cattle availability. It may be thought that the large farms are on the better soil (as was the original intention of designating Crown land for colonisation), but if it were as simple as that, the State land categories should have shown productivity superior to customary land, which

¹²⁴ Not spurious, because land documentation almost certainly precedes the other factors in most cases, except for ‘years since farm acquisition.’

they failed to do when controlling for agronomic factors. This anomalous finding therefore is likely due to an unidentified and unmeasured intervening variable or variables between area cultivated and labour productivity.

6.1.2.3 Determinants of total crop value per hectare and per unit labour

As shown in Section 6.1.1.2, some households cultivate higher-value crops like cotton that contribute more to total crop value per cultivated hectare than does maize. Thus the determinants of total crop value per hectare are substantively interesting, for their (presumed) relation to income.

In OLS regression with total crop value per cultivated hectare as the dependent variable, to the same set of independent variables is added proportion of total cultivated hectares devoted to cotton (the highest-value common crop reported by respondents). Planting density is dropped, because total crop value combines different crops. In the regression results (Table 6.9, column 1), most of the significant determinants of total crop value per cultivated hectare are intuitively plausible. More cotton planted means more value (not necessarily profit) per hectare; value per hectare declines as area cultivated increases. The insignificance of ‘credit use’ is understandable because both fertiliser and cotton seed are significant in the model and are mainly supplied through credit. The fairly strong effect of cattle ownership is somewhat surprising, as cattle might have been expected to affect production mainly through greater area cultivated, or through securing credit or obtaining income to buy fertiliser; again, cattle owners’ likely ability to optimise the timing of ploughing and planting, perhaps combined with manuring or more effective tillage with animal traction (both unmeasured), may explain how cattle contribute to land productivity. Among land documentation categories, only ‘HHH’s relative holds lease’ differs significantly (at 10%), and negatively, from the base category of customary land. Lease- and title-holders do not, possibly because of their larger area cultivated (see Table 5.1), and/or because their advantage operated via cotton and cattle.

In OLS regression on total crop value per unit farm labour force (Table 6.9, Column 2), the negative and significant coefficient for ‘HH labour force’ plausibly signals declining marginal productivity of labour; the positive coefficient for area cultivated plausibly implies that labour productivity increases as more land is cultivated (and presumably planting is less tightly spaced). The positive and significant coefficients for ‘cotton’s proportion’ and ‘fertiliser use’ are understandable, as is that for ‘cattle ownership’ (because animal traction should increase labour productivity directly by increasing area cultivated per capita, in addition to its putative improvement of the timing of planting which might explain its effect on land productivity). Perhaps most interesting for this study, ‘fixed investments’ are shown to improve labour

Table 6.9: Regression Results, Determinants of Total Crop Value per hectare cultivated and per unit farm labour force

Independent Variables	Dependent Variable			
	1.		2.	
	Total Value of Crop Output per Hectare Cultivated (ln)		Total Value of Crop Output per Farm Labor Force (ln)	
	Coefficients		Coefficients	
	B	Beta	B	Beta
(Constant)	11.926 (43.30)		11.339 (36.32)	
No document / State land	-0.002 (-0.01)	-0.001	-0.019 (-0.11)	-0.006
HHH's relative holds lease	-0.338 (-1.78)	-0.108 *	-0.068 (-0.32)	-0.017
HHH's relative holds title	0.220 (1.08)	0.064	0.231 (0.99)	0.051
HHH holds lease	0.241 (1.49)	0.099	0.391 (2.12)	0.121 **
HHH holds title	-0.028 (-0.15)	-0.011	0.001 (0.00)	0.000
HHH Age	0.001 (0.19)	0.015	0.002 (0.37)	0.024
HH labor force	-0.006 (-0.47)	-0.036	-0.117 (-8.46)	-0.572 ***
HHH's education	-0.004 (-0.20)	-0.014	-0.010 (-0.47)	-0.028
Parents' wealth index	0.029 (0.84)	0.050	0.037 (0.92)	0.047
Total Area (ha) cultivated 2000/01	-0.029 (-1.97)	-0.157 *	0.112 (6.60)	0.455 ***
Years since farm acquisition	0.005 (0.83)	0.059	-0.004 (-0.59)	-0.036
Distance to market	0.009 (1.26)	0.077	0.021 (2.58)	0.136 **
Fertilizer use (total kg per ha 00/01) (sq.rt.)	0.019 (1.91)	0.139 *	0.021 (1.82)	0.115 **
Number of cattle owned (sq.rt.)	0.126 (4.50)	0.338 ***	0.131 (4.09)	0.266 ***
Cotton's proportion of area cultivated 00/01	1.544 (4.93)	0.290 ***	1.660 (4.67)	0.236 ***
Fixed investments (aggregate cost) (ln ** 2.56)	0.000 (0.79)	0.056	0.000 (1.99)	0.123 **
Credit use (total value of loans last 5 years) (sq.rt.)	0.000 (-0.25)	-0.019	0.000 (-0.40)	-0.026
Observations	239		241	
Adjusted R-square	0.274		0.454	

Note: Numbers in parentheses are *t*-values.

*Significant at 10%; **Significant at 5%; ***Significant at 1%.

B coefficient = unstandardised, *beta* coefficient = standardised.

productivity, as indeed would be one of their obvious purposes. This demonstrates a causal chain by which land tenure (already shown to positively affect fixed investments, in the regressions in Chapter 5) improves productivity. The insignificance of land documentation categories (except for 'HHH holds lease') is understandable in that land tenure's effects can be expected to operate through the other significant variables. Most of the superiority of lease- and title-holders' productivity (Table 5.1, 'Total crop value per hectare') is therefore a function of intervening variables including labour force, cattle, fertiliser use, area cultivated, fixed investments, and cotton production.¹²⁵

6.1.3 Conclusions on Land Tenure and Productivity

The purpose of this section has been to explore whether land tenure and fixed investments are associated with greater field-crop productivity; and if not, whether plausible alternatives and more proximate causes emerge. Regression on models containing the full array of socio-economic and agronomic variables plus land documentation categories produced the following variables with significant coefficients (assembled in Table 6.10, in descending order of standardised coefficient magnitude; coefficients positive unless followed by [-]):

¹²⁵ Residuals plots (see Annex 2, Sections A-2.5 and A-2.6) are acceptable, but for safety, White's Test is applied. It finds no confirmation of heteroscedasticity in the regression on total crop value per ha ($n * R^2 = 27.85$, $df(238)$, NS). Similarly, for the companion regression on total crop value per unit labour (Table 6.9, Column 2), White's test is negative ($n * R^2 = 55.91$, $df(241)$, NS).

Table 6.10: Summary of regression results, land and labour productivity

	Land productivity	Labour productivity
Hybrid maize	Planting density (kg seed / ha) Number of cattle owned Fertiliser use (kg/ha)	HH labour force (-) Total area (ha) cultivated Number of cattle owned Fixed investments (aggregate cost) Planting density (kg seed / ha) Years since farm acquisition (-)
Local maize	Planting density (kg seed / ha) Number of cattle owned Fertiliser use (kg/ha) Fixed investments (aggregate cost)	HH labour force (-) Total area (ha) cultivated Number of cattle owned HHH's relative holds title Planting density (kg seed / ha)
Total crop value	Number of cattle owned Cotton's proportion of area cultivated Total area cultivated (-) Fertiliser use (kg/ha) HHH's relative holds lease (-)	HH labour force (-) Total area cultivated Number of cattle owned Cotton's proportion of area cultivated Distance to market Fixed investments HHH holds lease Fertiliser use (kg/ha)

The land documentation categories appear only irregularly and with mixed signs. Therefore the advantage of certain documentation categories appears to mostly operate through the remaining significant variables. Of particular interest in this regard are fixed investments, which influence hybrid maize labour productivity, local maize land productivity, and total crop value per unit labour. Even more noteworthy is cattle ownership, which is the only variable to appear as a determinant of each of the six measures of productivity. If land tenure reform is no longer to be considered a 'magic bullet' against rural stagnation, perhaps cattle (in this study area) should be.

With respect to the hypotheses about farm productivity:

"Farms with greater tenure security have greater productivity of field crops:

Farms on State land have greater productivity (per hectare and per unit labour) than farms on customary land;

Titled farms have greater productivity than untitled farms on either State or customary land, through intervening socio-economic and agronomic variables."

Farms on State land do have significantly greater local maize yields and total crop value (per unit land and labour) than farms on customary land; hybrid maize yields did not differ significantly (Section 6.1.1). Regarding title-holders versus other land documentation categories, in simple median tests without control variables (Section 6.1.2), titled farms differ with fluctuating significance from untitled farms in hybrid and local maize yields; they differ significantly in total crop value per ha. Median tests of labour productivity (Section 6.1.2.2) show title-holders leading significantly in hybrid maize production and total crop value per unit labour; however, lease-holders lead local maize labour productivity. In regressions on a full model of intervening factors, title *per se* is not associated with significant differences in land or labour productivity of maize or total crop value. However, at least one variable associated with title—fixed investments—does influence some aspects of productivity. The analysis therefore only partially supports the hypotheses.

This section concludes with two caveats. First, exact determination of the key factors of productivity are better left for advanced agronomic methods, and certainly a time series of crop data over several years would be needed to detect trends with confidence. Second, increased maize productivity is not the only outcome of interest in this inquiry. It seems intuitively clear that an improvement of 10 or 20 percent in maize productivity per unit land or labour will not by itself lift a farming household out of poverty and vulnerability, nor transform it into a medium-sized commercial concern. Doubling the area under cultivation seems more likely to increase a household's income than incremental gains in yields, as does adopting high-value crops. (In particular, cotton's greater value per hectare, and therefore its potential to rapidly increase incomes, makes it a potentially interesting object of study.) Outcomes such as cattle ownership, area under cultivation, and access to higher-value crops may therefore be as pertinent as maize yields to household income and poverty alleviation. Even with the staple crop, productivity is but one means to an end.

6.2 Land Documentation and Credit Use

In the neo-classical model linking tenure security with agricultural development, credit is the key causal conduit. Full transfer rights implies the right to mortgage land, and the assumption is that credit markets will respond to this offer of collateral by providing credit on acceptable terms. Some of the reasons why this is not seen to work in the sub-Saharan African context were explored in Chapter 2. Also discussed in that chapter were reasons why tenure may affect credit supply by increasing perceived ability to repay even in the absence of mortgaging, that is, through the effects of tenure on security, fixed investments, and (to the extent that titled

farms tend to be larger than untitled) farm size. Which if any of these are true in this study area?

6.2.1 Sources, Terms, and Uses of Credit

In the particular case of Zambia, there are specific reasons to doubt that the hypothesised effects of tenure security on credit supply actually occur. There is a long history of non-market provision of smallholder credit through government-backed co-operatives, especially for maize growing. This has been partially reversed by policies of the new government since 1991, but as Table 6.11 indicates, sources of credit in the sample (cumulatively, for all reported loans in the last five years) are still heavily non-market:

Table 6.11: Sources of credit (cumulative, last 5 years)

	<i>Frequency</i>	<i>%</i>
Co-operative	25	10.5%
Private company	8	3.3%
NGO	41	17.2%
out-grower facility	36	15.1%
Food Reserve Agency	91	38.1%
Informal moneylender	5	2.1%
Other	1	0.4%
Unspecified 'financial institution'	32	13.4%
Total	239	100.0%

Zambia's Food Reserve Agency (FRA) is a central government agency established to maintain a strategic stock of maize against periodic shortages. It has become heavily involved on the production side, supplying fertiliser and hybrid seed on credit to smallholders, often through the (reconstituted) co-operatives. The FRA, co-operatives, and NGOs together account for 65.4% of reported loans in the sample (more if some of the unspecified responses for 'financial institution' refer to FRA or co-operatives). FRA typically lends in kind (mostly fertiliser) and receives payment in the form of maize (or cash, but at an unfavourable rate compared to paying in maize). It was noted by informants that FRA provision of credit was unusually intensive in the study year of 2000/2001, which coincided with national elections; therefore these data may not reflect typical trends.

The out-grower loans mostly involved cotton: 64% were for cotton seed, with the remainder being for fertiliser, pesticide, and (oddly enough) three instances of cash loans.

The types of collateral demanded and offered in the study area (Table 6.12) also do not augur well for widespread land mortgaging:

Table 6.12: Type of collateral (cumulative, last 5 years)

	<i>Frequency</i>	<i>%</i>
None	71	31.8%
cash deposit	130	58.3%
Livestock	7	3.1%
farm equipment	6	2.7%
part of harvest	7	3.1%
Land	1 ¹²⁶	0.4%
Other	1	0.4%
Total	223	100.0%

It is only with the Land Act of 1995 that the ban on land sales (Conversion of Titles Act, 1975) was withdrawn. It appears that mortgaging has been slow to emerge. Apart from whether sales (a necessary adjunct of mortgaging) are acceptable, there is the question of the strength of ownership instruments. As described previously, the strongest land ownership instrument in Zambia is still a 99-year lease. It is not clear that banks find this reassuring.¹²⁷ The occurrence of mortgaging livestock seems surprisingly low, given its apparent suitability.

Finally, it is clear from Table 6.11 that nearly all loans are for seasonal agricultural inputs:

Table 6.13: What was borrowed (cumulative, last 5 years)

	<i>Frequency</i>	<i>%</i>
Maize seed (hybrid)	16	6.6%
Fertiliser	181	75.1%
Cotton seed	31	12.9%
Cash	5	2.1%
Pesticide	2	0.8%
Sunflower seed	3	1.2%
Other	3	1.2%
Total	241	100.0%

¹²⁶ Case no. 0717ah02, a title-holder, reported using land as collateral for 2000 kg of fertiliser from a co-operative, 1998-99.

¹²⁷ One advisor on a national agricultural support project was emphatic that they do not: banks that accept titles as collateral are really securing the assets above ground. (Interview with James LaFleur, Executive Director / ZATAC, 13/9/2001, Lusaka.)

Only one case reported receiving a loan for long-term use on fixed investments.¹²⁸

Nonetheless, just because credit is non-market does not mean that people in certain land tenure categories have no advantage. Some categories might contain better-organised co-operatives that attract credit from FRA and other sources. Some might use influence to obtain credit, or their title might be taken by lenders as a signal of credit-worthiness. Also, it is possible that credit terms are sufficiently unattractive that people will buy their inputs outright if they can, meaning that credit is the recourse of the less wealthy.

6.2.2 Respondents' Opinions on Credit

Demand for credit was not indiscriminate within the sample: a large majority of respondents expressed an aversion to risking the loss of their land by using it as loan security. Asked how much credit they would take (large amount, moderate, small, or zero) if required to offer land as collateral, 83% responded that they would take zero credit under that condition. By contrast, less aversion to borrowing was expressed if it required using livestock or the harvest as collateral: 54% desired zero credit with livestock collateral, and 14% desired zero credit with harvest collateral. (Sensibly enough, if no collateral were required, only 6% would take zero credit.)

Despite this risk aversion, credit is not immaterial. Respondents who had borrowed in the previous five years were asked how important credit was to their farm production. 59.7% chose 'absolutely necessary' or 'very important'; 21.5% chose 'somewhat important,' 13.2% chose 'not very important,' and 5.6% chose 'zero importance.'

On the supply side, interviews with bank officials in Monze and Mazabuka¹²⁹ indicated that any such demand would not be met: with one minor exception, no bank reported making current loans to small and medium-sized farmers, with or without title.

Some respondents elaborated on titles, credit, farm development, and risk:

"I would like to seriously farm but I don't have animals, *[nor]* a sizeable piece of land. I can *[would be willing to]* take a loan of say K2 million to buy land and animals so that I can improve my farming. I want a title deed because someone, especially the

¹²⁸ Case no. 0727nh01, a 31-year-old male whose farm is on customary land, received a cash loan of Kw 1,200,000 from an NGO in 1999, due 2004, no collateral reported. He used it to build a burnt-brick house.

¹²⁹ Interview with Cornelius Namanyama (Loan Officer, ZNCB), 20/8/2001, Monze; Interview with Fidelis Mainza (Loan Officer, ZNCB), 1/8/2001, Mazabuka; Interview with Loan Officer, Barclays Bank, 21/8/2001, Mazabuka.

government itself, they can chase me from this land.” (Interview no. 0723th01, Mwanachingwala customary) [*This respondent cultivated 4.5 ha in 2000/2001.*]

“Repayment periods are too short hence you can’t make long-term investments...Farmers in settlements are not given loans individually but in groups.” (Interview no. 0720cn03, Muyobe settlement)

“I’m already old [*respondent was 39*] and it’s my children who do most of the work. If they hear that they won’t inherit the land then they will stop protecting it...Title deeds do give us access to get credit but currently the policy doesn’t encourage one to sacrifice a title. In case of natural disaster such as drought or floods these NGOs, private companies and government agents do not consider a cushioned form of loan recovery and you might end up losing your land for nothing. Loans are very risky nowadays because weather is also unpredictable.” (Interview no. 0720ah01, Kayuni West settlement)

“Lease allows for selling and transfer. Lease doesn’t allow for credit qualifications.” (Interview no. 0720ah02, Muyobe settlement)

“Titles are very important when it comes to getting credit.”¹³⁰ (Interview no. 0719cn03, Namilongwe settlement)

“Please the banks to assist us with agricultural loans so that we can effectively develop our farms e.g. buying irrigation equipment.” (Interview no. 0719th05, Namilongwe settlement)

“Don’t allow to get credit with 14-year lease unless title deed. So we can’t get loans for borehole and other fixed improvements.” (Interview no. 0718ah04, Namilongwe settlement)

“I want to get a title deed for my traditional land which my father left for us [*now being farmed by younger siblings*] especially me as the head of the family...I have a title but I have no access to a loan with fair interest. Commercial interest is too high. Market is very unpredictable especially maize thus I’ve become a bit timid about getting an agricultural loan. Could lose my land for nothing.” (Interview no. 0717ah02, Namilongwe settlement)

“Loans are not accessible by people without money (deposit).” (Interview no. 0714cn01, Hamudebwe customary)

“I want to inform you that I have seen that there is no difference between having a title and being on traditional land. There is no access to credit for implements & oxen. We are farming on my father-in-law’s titled land thus our security is not that 100% advantageous—anything could happen.” (Interview no. 0711ah03, Silwiili settlement) [*respondent is HHH’s wife; HHH’s father holds title to the settlement parcel*]

6.2.3 Credit Use By Land Documentation Category

Credit use can be measured variously: any loans vs. zero loans, total value of loans, average value per loan. For the sample overall, 44.4% reported no loans in the previous five years (including the study year); 29.7% reported one loan, 19.2% reported two, 5.3% reported three,

¹³⁰ The results from logistic regression (below) support this: even though almost no respondents reported securing a loan with land ownership, and no commercial bank reported lending to many small or medium farmers, titleholders still had more credit use, controlling for socio-economic factors.

and 1.5% reported four. For total value of loans over the previous five years,¹³¹ the distributions of values are heavily skewed, so the most useful measure is the proportion of each category that is above the overall median. Table 6.14 summarises data per land documentation category for percentage with any loan and percentage with above-median total value of loans (both past five years). The variation among categories is not very marked, except for the lease-holder category, which leads in both variables. A Pearson chi-square test shows the differences in proportions for ‘has had at least one loan in last 5 years’ to be significant at 10% (chi-square = 10.399, $p = 0.065$). Differences for percentage ‘having above-median total value of loans (last 5 years)’ are significant at 5% (Pearson chi-square = 12.748, $p = 0.026$).

Table 6.14: Land Documentation Category cross-tabulated with Credit Use

Land Documentation Category		Variable	
		Has had at least 1 loan in last 5 yrs.	Having above-median value of loans (last 5 yrs)
no doc, customary land	<i>number</i>	49	42
	<i>% of category</i>	48%	41%
no doc, State land	<i>number</i>	23	19
	<i>% of category</i>	53%	44%
HHH's relative holds lease	<i>number</i>	13	11
	<i>% of category</i>	59%	50%
HHH's relative holds title	<i>number</i>	9	9
	<i>% of category</i>	50%	50%
HHH holds lease in own name	<i>number</i>	32	30
	<i>% of category</i>	76%	71%
HHH holds title in own name	<i>number</i>	22	22
	<i>% of category</i>	58%	58%
Total	<i>number</i>	148	133
	<i>% of category</i>	56%	50%

Examining the medians of average loan value (total loans value divided by number of loans) shows lease-holders and title-holders occupying first and second place (69% and 58% respectively, not shown on table), with relatives of lease- and title-holders in the middle, and those without document on State or customary in the last two places (47% and 42% respectively). This result is significant at 10% (Pearson chi-square = 10.043, $p = 0.074$).

¹³¹ Calculated, for loans received and repaid in kind, according to mean reported selling price for the in-kind good used for repayment (e.g. maize for borrowed fertiliser).

CONCLUSIONS: From this preliminary analysis, lease-holders and title-holders consistently rank first in credit use, whether measured by occurrence, total (cumulative) value, or average value per loan. Relatives of lease- or title-holders tend to occupy the middle ranks. Among those without document, there seems to be little difference between those on State and customary land; both are consistently outscored by the rest. Overall credit use, while hardly impressive at 55%, seems slightly less dire than recent Zambia studies might lead one to expect, possibly due to easy election-year credit from the FRA. The variations in credit use among land documentation categories also seem moderate, possibly for the same reason.

6.2.4 Other Determinants of Credit Use

Since mortgaging is practically non-existent in the sample, it remains to identify the precise causal mechanisms that explain the association between land documentation and increased credit use. Linear regression is unavailable because of the large cluster (120 cases) of zero credit use. Logistic, ordinal, and Tobit regression¹³² will be used instead (at some sacrifice of data detail).

In addition to the land documentation categories, the following variables (similar to the set used in previous regressions) are included in the model:

- Head of household (HHH) Age
- HHH Educational level / attainment
- Household Income
- Fixed investment
- Total farm size¹³³
- HHH's parents' socio-economic status
- Household labour force
- Distance to market
- Years since parcel acquisition
- Cattle ownership

¹³² It is conceded that the case for this distribution being a true censored distribution, rather than having a natural end-point of zero, is somewhat more tenuous than that for the distribution of fixed investment (Ch. 5). Whereas negative land improvements are likely to exist despite being unmeasured in this survey, negative credit use (i.e. lending rather than borrowing because conditions of borrowing are unattractive) likely remains a dream for most.

¹³³ Total farm size is preferable to area under cultivation for this model, because: (a) it is more antecedent than area under cultivation, which might be as much the result as the determinant of borrowing inputs; and (b) although either total farm size or area cultivated may reassure lenders about the farmer's ability to repay, such reassurance is likely to be reinforced by factors that are better reflected in total farm size than in mere area cultivated, such as grazing areas and hence cattle herds.

The dependent variable of total value of loans (over the last five years) is bifurcated at the median for logistic regression. Results include a $-2\log(\text{likelihood})$ of 307.7, indicating a not-especially good fit for the model. Cox & Snell R-square is .118, Nagelkerke R-square is .157, indicating low predictive power. Percentage correct improves moderately, from 50.0% to 66.4%. Remarkably, no variables have coefficients significant at 5%, and only one is significant to the 90% level: 'HH labour force' ($\text{Exp}[B] = 1.071, p = 0.050$). The $\text{exp}(B)$ score greater than one indicates that the variable is positively associated with likelihood of being above the median.

If the eleven cases with outlying residuals in this regression¹³⁴ are excluded, the resulting regression shows a similar change in correct classification (51.9% to 72.5%); the $-2\log(\text{likelihood})$ improves to 246.0, Cox & Snell R-squared improves to .280, and Nagelkerke R-square to .374. 'HH labour force' ($\text{Exp}[B] = 1.162, p < 0.01$) and 'cattle ownership' ($\text{Exp}[B] = 1.534, p < 0.01$) are significant at 1%; 'total farm size' ($\text{Exp}[B] = 1.218, p = 0.049$) and 'fixed investment' ($\text{Exp}[B] = 1.001, p = 0.098$) have weaker significance. So the correlates of having above-median total borrowing require some trimming of extremes to isolate.

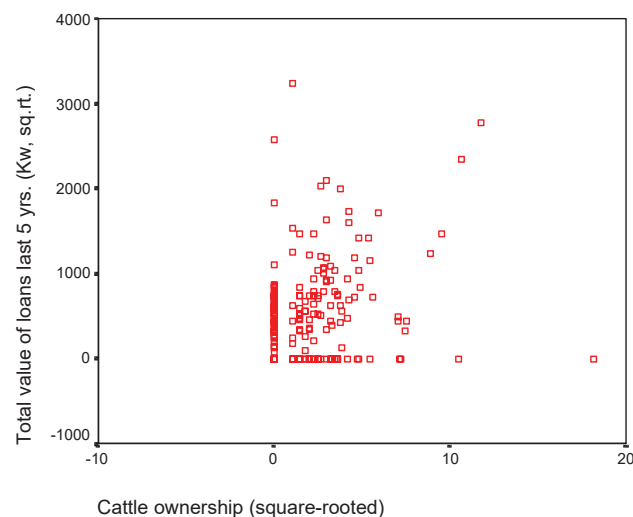
Ordinal regression (splitting the dependent variable into terciles) produces a significant coefficient (parameter estimate) only for cattle ownership (estimate = .206, $p = 0.010$). Tobit regression (excluding four cases of extreme cattle ownership >100 head) produces significant coefficients for 'cattle ownership' (coefficient = 22492.8, $p = 0.017$), 'HH labour force' (41020, $p = 0.050$), and 'distance to market' (34624.34, $p = 0.013$). The correlates of credit use that are robust to method are therefore HH labour force and cattle ownership.

Why such low pseudo-R-squares and low number of significant variables? Credit use as a dependent variable may be particularly susceptible to having large random terms, because it results from a nexus of credit supply and demand which in turn depend *inter alia* on unmeasured or unmeasurable factors in this study area: on the demand side, risk aversion (heightened by the fact that the repayment price of fertiliser was unknown at the time of borrowing); on the supply side, administrative, possibly non-transparent allocation of credit. Also, reviewing credit use across land documentation categories (Table 6.14), the category with the greatest use is lease-holders, not title-holders. Because title-holders have greater total crop value, income, and cattle than lease-holders (Table 5.1), it may be said that the credit use curve with respect to wealth has an inverse U-shape. One interpretation of this is that the poor cannot get credit, and the rich do not need it.

¹³⁴ Three of those are on the same settlement (Kayuni West), suggesting a local anomalous factor.

Cattle's interaction with credit is ambiguous. Ample cattle herds may obviate credit in the sense that cattle can be a source of cash for buying seasonal inputs, through renting out for traction, milking, or sale and slaughter (though it seems unlikely in this cattle-oriented area that a farmer would give up a healthy animal in exchange for the risks of planting maize). They may also stimulate credit demand by expanding area under cultivation, thus necessitating more inputs. They could theoretically secure credit as collateral, but this is rare in the study area.¹³⁵ The scatterplot (Figure 6.2) of cattle ownership against total borrowing shows a diagonal relationship, although with outlying exceptions near each axis:

Figure 6.2 Scatterplot, Total value of loans received over last 5 years vs. cattle ownership (both square-rooted)



Recalling, however, that FRA (the main lender in the study area) requires a cash deposit as collateral, and one respondent's comment (above, Section 6.2.2) that access to credit is near impossible without the cash deposit, cattle's effect on credit use may be through this mechanism—by contributing enough to income to enable making the cash deposit.

The link between household labour force and total borrowing probably also operates through greater area under cultivation, hence greater demand for inputs, and perhaps greater lender confidence in ability to repay.

¹³⁵ On an immediate policy point, it is remarkable that no loans for the purpose of buying livestock were reported in the sample. As many respondents complained about the loss of cattle to corridor disease in recent years, and as this study has made clear that cattle ownership is associated with various aspects of farm performance (productivity, fixed investments, and now credit use), and especially considering that the study area is (at the time of writing, 2003) suffering major food shortages, a strong policy recommendation is that livestock credit programmes be implemented with urgency.

6.2.5 Conclusions on Land Documentation and Credit Use

With respect to the hypothesis ('Farms with greater tenure security have higher credit use than farms with lesser security') and the sub-hypothesis ('Titled farms have higher credit use than untitled farms'), these analyses support the hypothesis that farms under title or lease have greater credit use, compared to categories of lesser or no documentation. These differences emerge in simple cross-tabulations of credit use against documentation category (Table 6.14). Regression indicates that the association with lease- and title-holding vanishes when household labour force, cattle ownership, total farm size, and (only in the Tobit regression) distance to market are controlled for, indicating that the latter are more proximate causes. It is nonetheless noteworthy that title- and lease-holders borrow more even in the absence of market provision of credit, where document holders might have an obvious advantage. On the other hand, the occurrence of credit in the sample was almost entirely short-term and seasonal, which is not the kind of credit for which land would logically be offered as collateral. On a practical level, farmers expressed strong aversion to securing loans with land, and local bankers for their part mostly do not lend to small and medium farmers.

6.3 Inter-Generational Trends

This section explores inter-generational trends in family farming with respect to land tenure. After reviewing antecedent disposition of respondents' parents' farmland, two main outcomes are examined: HHH's children's educational attainment and children's profession.

6.3.1 Disposition of Parents' Farmland

The inter-generational perspective can start with respondents' parents. Respondents were asked to whom their parents' farmland had gone (if the parents were deceased or no longer farming). Among the relevant sub-sample, in the plurality of cases (44%, or 70/158) the parents' farmland had gone to the offspring (respondent and siblings). In 6% of cases, the land went to the respondent alone; in 3% the land went to the siblings but none to the respondent. In only 3% of cases (5/158) did the land go to the respondent's mother's relatives, indicating that matrilineal succession is rare in the sample. However patrilineal repossession is nearly dominant: in 39% of cases, the land went to the respondent's father's relatives. (This is more frequent on State land: 48% of cases, vs. 23% on customary. This might be related to the phenomenon reported above in Ch. 3 that some settlement parcels were acquired by extended families as a sort of group investment.)

Regarding who decided the allocation of parents' farmland, the respondent's father was reported to have decided in 34% of cases, but father's relatives decided in 36% of cases. Other responses included: mother's relative (2%), chief (12%), and headman (7%). This is consistent with previously cited reports of the decline of matrilineal control over land (Mvunga 1982, Bruce and Dörner 1982, Place et al. 1995; see Ch. 3).

6.3.2 Children's Educational Attainment

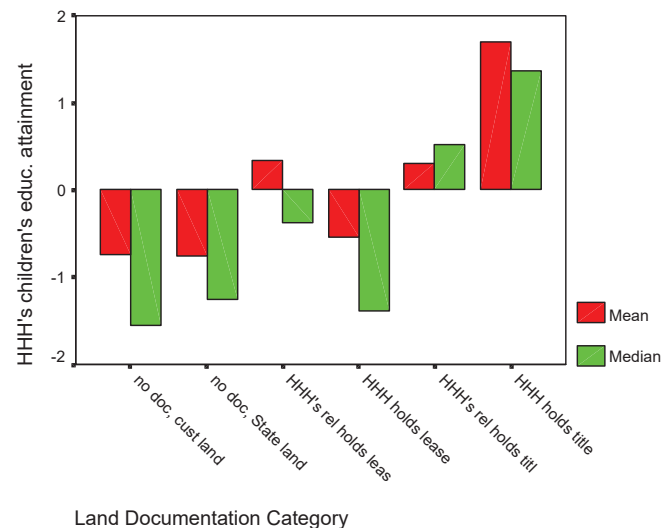
A study in Zambia's Copperbelt Province (Oxfam-GB, 1999) argued that current agricultural problems have inter-generational effects, particularly on children's education. School fees are a major part of farm family expenditure, so offspring's education suffers when farm incomes decline. At peak periods of farm labouring, children stay home from school to work the fields; or if they go to school, some teachers divert them to work without payment in their own fields. During the hungry period in December and January (just before harvest), some children are too hungry to travel daily the often long distances to school. (Oxfam-GB, 1999: 38-39)

Does land tenure have an effect on (or association with) the educational attainment of the household's children, and if so, through what intervening variables (such as the HHH's own educational attainment)? Data were collected on the age and grade completion of children in the household, although there were numerous missing values due to respondent non-recall, as well as confusion as to which children were the HHH's own and which were those of relatives or others. Also automatically excluded were those households with no school-age children as yet. In the end, figures were calculated for 142 cases, just over half the sample. Indices were derived for proportions completing 7th, 9th, and 12th grades, as well as a combined index aggregating all three grades via *z*-scores. (Details on the method for calculating the indices appear in Annex A-1.4.)

We start with the aggregate index. Its distribution is skewed, with a plurality of zero-education cases, making the mean unreliable. On the other hand, the means and medians mostly parallel one another with respect to land documentation categories (Figure 6.3):¹³⁶

¹³⁶ Since this aggregate educational attainment variable (vertical axis) is a sum of *z*-scores of separate variables for percentage of children attaining 7th, 9th, or 12th grade, the values on the vertical axis do not correspond directly with any grade or percentage.

Figure 6.3: HHH's children's educational attainment (aggregate index) by Land Documentation Category



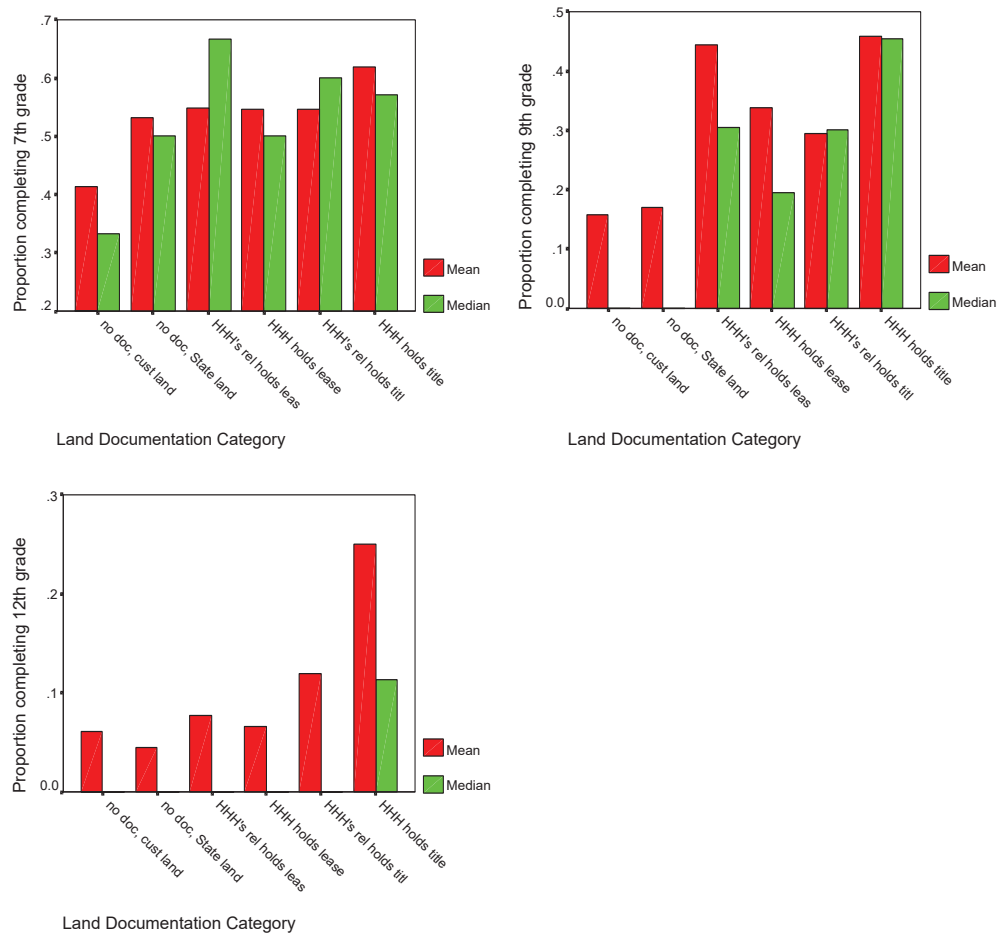
The median test is significant (chi-square = 17.880, $p < 0.01$). The visible difference between the lowest and highest medians is therefore sharp enough to be generalisable. However, if the median test is restricted to the first three categories, then the result is insignificant (chi-square = 2.073, $p = 0.355$), as one would expect from their relative similarity on the plot.

These results are therefore remarkably similar to the analysis between land tenure and fixed investments. Title-holders (though not lease-holders) have generally superior children's educational attainment. Those on State land with less secure documentation do not differ significantly from the base category of customary land.

As a further exploration, the exercise can be repeated using dependent variables that are the original percentages for each marker grade, without the z-score transformation and aggregation. This would also reveal whether the pattern of superiority for the titleholder category holds for each grade, or whether, for instance, the titleholder category only pulls away from the others at the higher grades.

The dependent variables therefore represent proportion of age-eligible children of the HHH who have completed the relevant grade (7th, 9th, or 12th). Figure 6.4 plots the means and medians:

Figure 6.4: HHH's children's educational attainment (7th, 9th, & 12th grade completion), Means and Medians by Land Documentation Category



(On the chart for 12th grade, the absence of median bars for most categories indicates medians of zero.)

The means and medians diverge in several cases, so median tests are preferable to ANOVA. It appears that there is less difference in 7th grade than in the others; and indeed, the median test is not significant for 7th grade, but is significant for 9th and 12th grades ($p < 0.01$ in both cases). The differences among land documentation categories therefore emerge only in the higher grades: no significant differences at the 7th-grade level, but significant differences between titleholders and those without documents at the 9th and 12th-grade levels. Also, we see that those without documents on State land do not differ significantly from those on customary land at any of the marker grades.

It remains to analyse offspring's educational attainment with respect to land tenure status controlling for socio-economic variables that may vary with tenure status and also have an independent association with the dependent variable. A regression model is constructed with the combined z-score of grade completion as the dependent variable, and secure documentation category (dummies) as the independent variable. Control variables will include:

- Total household income
- HHH age
- HHH's highest school grade completed
- Parents' wealth proxy
- HH size¹³⁷
- Distance to market
- Cattle ownership¹³⁸

(It is possible that there is also a gender factor in grade completion, but gender-specific completion could not be disaggregated from the data.)

Like credit use (Section 6.2.4), the aggregate educational index has a non-normal distribution with a cluster at zero, necessitating ordinal regression, with Tobit regression as an alternative.¹³⁹ In any event, the two methods yield similar results (Table 6.15). Variables with significant coefficients are: HHH's educational attainment and HHH age (both significant at 1%), HHH's relative holds lease (5%), and HHH holds title (10%). (In the Tobit regression only, total HH income is significant at 5%.) All of the significant coefficients are positive.

This appears to be a substantively interesting result. The significance of 'HHH Age' is at least in part an artefact of the derivation of the dependent variable.¹⁴⁰ The strong showing of 'HHH's highest grade finished' implies a plausible causal mechanism. But for the purposes of

¹³⁷ It may be postulated that greater HH size will be associated with lesser grade completion percentage, as greater HH size implies more children to support through school.

¹³⁸ This can be considered a proxy for wealth or liquidity, potentially relevant for school completion, as livestock can be sold or slaughtered punctually to raise school fees.

¹³⁹ Again as with credit, it is conceded that the distribution of the educational index may not be a truly censored distribution. Children's educational attainment results from a nexus of supply and demand, so it is difficult to theoretically isolate the factors that could cause households to attain negative education for their children, should such be measurable. It will be treated as censored on the argument that zero education results from necessity, not choice.

¹⁴⁰ We recall that the dependent variable is a cumulative score of grade completers divided by number of children (subtracting those under school age), but without perfect age tracking. This means that a middle-aged family with three children under 20 all of whom have completed 9th grade on time, will score less than an older family with three children over 20 all of whom have completed 12th grade, even though the younger family is equally on track for grade completion. (This sub-optimal method was necessitated by non-sampling error on number and ages of HHH's own children and number who have completed each grade.) Accordingly, the strong association between the dependent variable and 'HHH Age' should not be given too much substantive importance: it is at least in part an artefact of the age bias of the dependent variable's method of calculation.

Table 6.15: Regression results, determinants of children's aggregate educational attainment

Independent Variables	Dependent Variable			
	Column 1		Column 2	
	Children's aggregate educational attainment (ordinal regression)		Children's aggregate educational attainment (tobit regression)	
	Parameter estimates	SE	Coefficients	SE
(Constant)			-8.235 (-6.21)	1.326
No document / customary land	(reference category)		(reference category)	
No document / State land	0.244 (0.24)	0.493353	-0.157 (-0.22)	0.701
HHH's relative holds lease	1.488 (5.71)	0.622605 **	2.226 (2.50)	0.890 **
HHH's relative holds title	0.922 (2.38)	0.598468	0.719 (0.84)	0.853
HHH holds lease	-0.007 (<0.01)	0.538638	-0.246 (-0.32)	0.762
HHH holds title	1.024 (3.41)	0.554561 *	1.300 (1.78)	0.729 *
HHH Age	0.074 (30.20)	0.013509 ***	0.109 (5.87)	0.018 ***
HH size	0.011 (0.24)	2.19E-02	-0.005 (-0.17)	0.032
HHH's education	0.155 (7.92)	0.055262 ***	0.237 (3.11)	0.076 ***
Parents' wealth index	0.025 (0.05)	0.110319	0.040 (0.25)	0.160
Total HH income 2000/01	<0.001 (1.35)	6.53E-08	1.92E-07 (1.97)	9.74E-08 *
Distance to market	-0.007 (0.11)	0.022204	-0.010 (-0.32)	0.032
Number of cattle owned	-0.050 (0.24)	0.10158	-0.014 (-1.23)	0.011
Number of observations	138			137
-2LL (final)	388.331		No. of left-censored obs. at zero	32
Chi-square (df=12)	52.925 ***		LR chi ² (12)	53.92
Cox & Snell R Square	0.319		Prob > chi ²	0
Nagelkerke R Square	0.332		Pseudo R ²	0.0903
Goodness-of-fit: Pearson chi-square (df=536)	542.886		Log likelihood	-271.523

Note: Numbers in parentheses are Wald values in Column 1, and *t* values in Column 2.

*Significant at 10%; **Significant at 5%; ***Significant at 1%

this inquiry, it is relevant to note that the title-holder category differed significantly from the base category of customary farmers, whereas those without document on State land did not, even controlling for household income, cattle wealth, HHH's education, and distance to market (which may parallel distance to school). On the other hand, lease-holders did not differ from customary households, whereas relatives of lease-holders did; so the effect of land documentation on children's education appears to be irregular. The results are robust to method, being almost identical with ordinal and Tobit regression.

To summarise this inquiry into links between land documentation and children's educational attainment, the first step revealed differences, some significant, in median levels among the land documentation categories. The differences were not significant at the 7th grade level, but emerged at the 9th and 12th grades. It was then necessary to ascertain whether these differences persist when other socio-economic factors such as income are controlled for. It was found that they largely do persist: in regression, the documentation categories of titleholders and relatives of leaseholders both differ significantly in offspring's educational attainment from the reference category of 'no document, customary land,' even controlling for other socio-economic variables that can be expected to affect educational attainment. This finding is interesting, but the mechanism by which tenure status affects offspring's educational attainment is not obvious—how title-holders and relatives of lease-holders send their children to school, or how they draw school to their children. Neither is it clear why the category of 'HHH's relative holds lease' has surpassed the others (especially the similar 'HHH's relative holds title') in association with offspring's educational attainment. Frequencies in these categories are somewhat low after excluding those cases for which the children's education variables could not be calculated: there remain 12 cases of 'HHH's relative holds lease,' and 25 of 'HHH holds title in own name.' It seems reasonable to suspect that the former's appearance as a strong associate of offspring's educational attainment may be a random effect of low frequencies; whereas with the titleholders, the somewhat larger frequency plus the consistency of that category's significance in the median tests as well as the regression argue for giving it more substantive weight. On the other hand, land tenure categories that are arguably more secure than 'HHH's relative holds lease' (e.g. 'HHH's relative holds title' and 'HHH holds lease in own name') do not share that category's advantage in educational attainment, which makes it more difficult to argue that the tenure security itself is having a direct causal effect. It is more likely that some antecedent advantages explain both title-holding and access to education.

Another consideration is the possibility of reverse causal mechanisms: greater offspring's educational attainment may have an effect on tenure status, for example acquisition of titles. It

is possible that well-educated adult children are helping their parents to obtain titles, if only out of self-interest because of inheritance.

Some variables are surprising for their lack of significance, and rule out some possible causal avenues for title-holders' effect. 'Total household income,' which was an obvious possibility for explaining how title-holders get their children through school, was consistently significant only in one of the two regression methods (though as mentioned, current-year income is an imperfect proxy for income history). It seems that when other factors are controlled for, household income is only a weak predictor of offspring's educational attainment. (Nor should it be otherwise, in an ideal situation of universal free education, but there is little indication that the study area has attained this ideal.) Cattle ownership has no association; neither does household size, implying that having large numbers of children does not affect the percentage who will complete school.

Nonetheless, although the exact causal mechanisms are yet to be identified, it seems that one of the intents behind the establishment of settlement schemes on State land in Southern Province, to create a class of emergent commercial farmers, has succeeded in the sense that the title-holding cohort is educating the next generation more successfully than its counterparts without title or on customary land.

6.3.3 Children's Work / Profession

Another aspect of the inter-generational effects of land tenure is the actual or planned main work of the HHH's (adult) children.¹⁴¹ The question was asked, "Does your tenure status affect your children's plans about what kind of work they will do, in other words, whether they will be farmers?" 45 responded 'yes' (18.1% of valid responses), and 203 responded no (81.9%). On State land, 22.4% responded 'yes,' compared to 11.5% on customary land.

If the answer was 'yes,' the open-ended follow-up question was asked, "How does it affect children's plans?" The resulting comments (recorded briefly on the questionnaire) varied between those citing tenure security and insecurity. Table 6.16 contains an illustrative selection, cross-tabulated with certain land tenure (documentation) categories.

¹⁴¹As with education, it is likely that there is a gender dimension; however it was not possible to disaggregate children's profession by gender from the data.

Table 6.16: Respondent observations on land tenure's effects on their children's plans

CUSTOMARY LAND	NO DOC, STATE LAND	TITLEHOLDERS ¹⁴²
<p>'There have been threats before of dispossession'</p> <p>'Children might fail to inherit the land'</p> <p>'Friend may claim land when [respondent] dies'</p> <p>'Other relatives may grab land without title'</p> <p>'Owners may claim this land'</p> <p>'Tenure insecurity without title'</p> <p>'They are my wife's blood'¹⁴³</p> <p>'They won't feel secure about farming'</p>	<p>'Feel insecure because no title'</p> <p>'Lack of security may cause them to settle elsewhere'</p> <p>'Son worried about inheritance without title, because of other relatives'</p> <p>'They think they need title'</p> <p>'Without title, no fixed investment, so children feel insecure'</p> <p>'Without title it is difficult; they may want to shift'</p> <p>'They want to be farmers on their own land'</p>	<p>'There is a title'</p> <p>'Children are already farming plots on titled parcel'</p> <p>'They know they can come & farm when retired'</p> <p>'Not paying attention in school / want to be farmers'</p> <p>'They are confident to be farmers'</p> <p>'They feel encouraged to be farmers'</p> <p>'Title gives them confidence to be farmers'</p>

Note that a large majority in each category responded that their tenure status makes no difference to their children's plans. Therefore the above comments are not to be considered representative of their whole categories (each of whose majority expressed nonchalance); rather, they are representative of the minority in each category who stated that their tenure status does affect their children's plans. The comments are generally unidirectional, in the sense that title is seen as a remedy, both on State and customary land, for insecurity or rival claims where they occur.

In addition to parents' opinions on whether tenure status affected their children's plans, the actual main work of their children (for those whose children were working-age) was recorded. (Up to four responses were recorded per case for those who had more than one adult child.) Responses were subsequently re-grouped: 'full-time farmer' remains in its own category; 'civil service,' 'other salaried worker' (e.g. teacher), and 'business/trade' are grouped as 'white-collar' or salaried workers; the other responses are dropped from the analysis and treated as missing cases. The four responses are rendered into binary variables reflecting any full-time farmers or none, and any white-collar or none. Since cases that gave any of the other responses implying no work (e.g. 'still in school') are treated as missing, a zero value in the binary variable (i.e. 'none of the adult children are full-time farmers') means that some valid

¹⁴² Lease-holders gave responses similar to those of title-holders, apparently unconcerned about the difference. None, for example, bemoaned the lack of title or the inferiority of a lease with respect to their children's plans or security.

¹⁴³ Apparently a reference to matrilinearity.

work response was cited, but not farmer.¹⁴⁴ Since the respondent could describe the profession of up to four children, the categories of white-collar and farmer are not mutually exclusive: a household can have one of either, one of each, or none.

Is there a difference among land tenure categories in occurrence of full-time farmers or salaried workers among HHH's children? Table 6.17 is a cross-tabulation with documentation category:

Table 6.17: Land Documentation Category cross-tabulated with 'any full-time farmers' or 'any white-collar workers among working children'

Land Documentation Category		Variable	
		at least one full-time farmer	at least one white-collar
no doc, customary land	<i>number</i>	21	22
	<i>% of category</i>	54%	56%
no doc, State land	<i>number</i>	11	9
	<i>% of category</i>	52%	43%
HHH's relative holds lease	<i>number</i>	3	4
	<i>% of category</i>	50%	67%
HHH's relative holds title	<i>number</i>	5	4
	<i>% of category</i>	56%	44%
HHH holds lease in own name	<i>number</i>	13	12
	<i>% of category</i>	68%	63%
HHH holds title in own name	<i>number</i>	17	21
	<i>% of category</i>	63%	78%
Total	<i>number</i>	70	72
	<i>% of category</i>	58%	60%

Overall, 58% of households cited at least one full-time farmer among the HHH's adult children. The highest proportion is in the lease-holder category, followed by title-holder, and the lowest is in 'HHH's relative holds lease.' These are fairly slight variations, given the small sub-sample size. A chi-square test, to determine whether the differences in proportions among categories is statistically significant, fails to attain significance (Pearson chi-square = 1.845, $p = 0.870$). A two-way comparison between only title-holders and customary land also fails to attain significance. The proportion of families with adult offspring who manage to establish one offspring as a full-time farmer (or perhaps it is more involuntary) is, in this sample, highest among lease- and title-holders, but by too small a margin to be generalisable.

¹⁴⁴ Since this inquiry does not concern unemployment or definitions thereof, the questionnaire did not attempt to disaggregate the 'not applicable / not working yet' response, to determine which referred to offspring below working age and which referred to unemployment of adult offspring. However the majority of cases who gave this response have no children over 20 years of age.

For proportion per land category having at least one white-collar worker among children, title-holders lead with 78%, declining to 42.9% for 'no doc, State land.' These differences among all categories fail to achieve significance (Pearson chi-square = 7.392, $p = 0.193$). However, a two-way comparison between title-holders and customary land is significant at 10% (Pearson chi-square = 3.208, $p = 0.073$); and that between title-holders and 'no doc, State land' is significant at 5% (Pearson chi-square = 6.146, $p = 0.013$). So in the question of whether a household has established at least one adult offspring as a salaried worker, the differences between certain categories are sharp enough to be generalisable.

Having established certain differences, the causal mechanisms can be considered. The previous section on education of HHH's children showed an association with certain documentation categories (especially title-holders) that held when an array of socio-economic control variables were included in the model. Here, children's education can be expected to significantly influence the outcome as to whether any end up as salaried workers; so the effect of land tenure might be only indirect.

Logistic regressions can be performed, since the dependent variables are binary. Starting with whether the household has at least one full-time farmer among the HHH's adult offspring, the following independent variables are included: distance to market; years since farm acquisition; total household income; total area cultivated; parent's wealth index; HHH's highest school grade finished; household labour force; HHH age; and children's educational attainment aggregate index. Correct classification improves only slightly, from 63.3% to 69.6%. The $-2 \text{ Log(likelihood)}$ is 85.3; Cox & Snell R-square is .210, Nagelkerke R-Square is .287, indicating moderately low explanatory power for the model. The only variable with a significant coefficient is 'HHH's children's educational attainment index' ($p = 0.010$). The odds ratio for children's educational attainment is 0.673, indicating that as attainment rises, the likelihood of having at least one full-time farmer falls. It seems that educated offspring are not opting for the farming profession.

In logistic regression to determine the factors in having at least one salaried worker among the HHH's adult children, no variables are significant at 5%; however 'children's educational attainment' is significant at 10% ($p = 0.062$). Its Exp(B) (odds ratio) is 1.308; being greater than one, this indicates that as children's educational attainment increases, so the odds of having a salaried worker among the adult children increases (plausibly enough). The land documentation categories are all insignificant, along with all other control variables. So whatever effect these variables have on the outcome of attaining a salaried worker among the offspring, seems to be transmitted entirely through offspring's education. However the low Cox & Snell pseudo-R-square value (.183), and the scant improvement in correct classification

(54.4% to 62.0%), show that this model has captured relatively few of the causes of this outcome.

To summarise: the association apparent in the cross-tabulations between certain documentation categories and higher occurrence of salaried workers is shown by regression to be due to the intervening variable of children's educational attainment, which was previously shown to be associated with some of those same land tenure categories. Holding a title does have some effect on children's profession, but only indirectly, through their better educational attainment. Titles may encourage children to take up settlement farming upon inheritance, but that would not be revealed by these cross-sectional data.

6.3.4 Conclusions on Inter-Generational Trends

With respect to the hypotheses:

“Children of farm households with greater tenure security have different socio-economic trajectories:

- (A) Children of such households have higher educational attainment.
- (B) A greater proportion of children of such households obtain salaried jobs.”

The analyses support hypothesis A. Children of title-holders have greater educational attainment, compared to those without document on State or customary land, even controlling for socio-economic variables. Children of lease-holders, however, do not differ significantly, whereas those of relatives of lease-holders do. The greater educational attainment of title-holders' children emerges at or above the 9th grade level; at the 7th grade level, there are no significant differences in on-time grade completion.

The analyses also support hypothesis B. Title-holding is associated with a greater likelihood of having at least one salaried worker among offspring. Regression made clear that this is due to the intervening mechanism of offspring's education, which is higher among title-holders, and which seems likely to facilitate obtaining salaried work.

6.4 Access to Land and Determinants of Area Cultivated

A recent study (Zulu et al., 2000, described above in Ch. 3, Section 3.4.6) found indications that households' area cultivated per capita across Zambia was surprisingly unequal, even in remote customary districts where equity might have been expected to reign. In turn, the unequal areas cultivated appeared to be driving unequal incomes (analysed as value of crop

output): farms with larger areas cultivated tended to have greater crop value output per capita. However, the data used for that study did not distinguish between hectareage owned or accessible and hectareage cultivated, thus implying that unequal 'access to land' was coterminous with the demonstrated inequality of area cultivated. But this is to be proven not assumed: one can imagine reasons why households might not cultivate all available land (constraints on inputs like seed, fertiliser, labour, and animal traction). Voluntary reasons are also plausible, for instance choosing to produce only to subsistence levels and avoid market vagaries. Using value of crop output as an indicator also necessitates taking into account the proportion of land cultivated with high-value crops like cotton, and access to the relevant inputs. Is there then unequal access to land, to inputs, or to both?

6.4.1 Respondents' reports on access to land

According to respondents' own reports, access to land, or purported insufficiency thereof, does not appear to be an immediate and significant constraint on farm output in the study area. This is indicated by survey responses in which 56% of respondents confirmed that they did not cultivate all of the arable land available to their household this past season. Major reasons for this included lack of animal traction (cited by 45% of respondents), lack of seed (38%), and lack of fertiliser (26%). Only 13% cited intentional fallow as the reason.

On the other hand, when respondents were asked if they wanted more land for cultivation, 52% responded yes. (Of course, to ask if one wants more land is in a sense to ask if one wants more wealth, so affirmative answers do not necessarily indicate an insufficiency of land for subsistence farming.) Of those who responded no, when asked why they do not want more land, only 36% stated that they have enough land already; the remainder cited involuntary reasons, especially lack of animal traction (51%). Of those who responded that they want more land, a majority (55%) stated that they would not be able to obtain it, citing lack of available family or village lands (54%) or lack of money for buying, renting or leasing land (20%).

Among those who did want more land for farming, 49.2% reported cultivating all their fields this year, and 50.7% did not cultivate all. Among those who did not want more land, 38.1% cultivated all fields this year, and 61.9% did not. By a small margin, therefore, the sub-sample who do not want more land contains (as expected) a higher proportion of cases who did not manage to cultivate all available fields this year.

Also, many respondents (especially those on State settlements) said 'yes' in response to the question "Did you cultivate all your fields this year?", whereas the hectareage cultivated versus their total farm size makes it clear that they in fact did not. This may be due to respondent

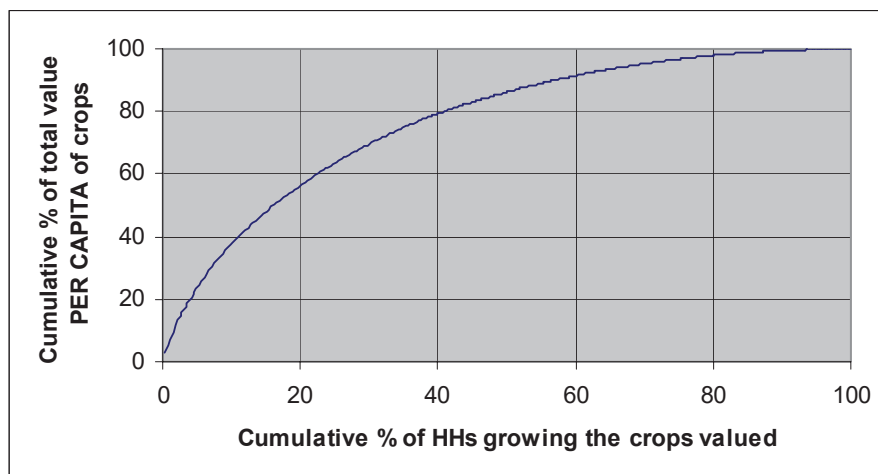
mis-representation for fear of accusations of under-utilisation. Or it may stem from the phrasing of the question: a ‘field’ is prepared terrain, but one can additionally possess non-prepared hectareage—either non-arable, forested, or arable but uncleared. Most settlement parcels were designed to contain large individual grazing areas. Also, ‘arable’ is difficult to define, because nearly any land, even waterlogged or arid, is potentially arable with enough investment, labour and inputs.

Inevitably, the sample in the current study is seriously skewed in the sense of being composed of farming households. Landless households would not have been selected (the sample being based on that used for a national farming survey), and indeed none were sampled. Therefore these data offer no information on putative landless households, who would be the most serious cases of lack of access to land. (See Chapter 3, Sections 3.3.2.2 and 3.3.4 for a discussion of historical land problems in Southern Province, including pressure on customary land and reports that households with inadequate land or none migrate to other provinces that have land surpluses.

6.4.2 Concentration of land and area under cultivation

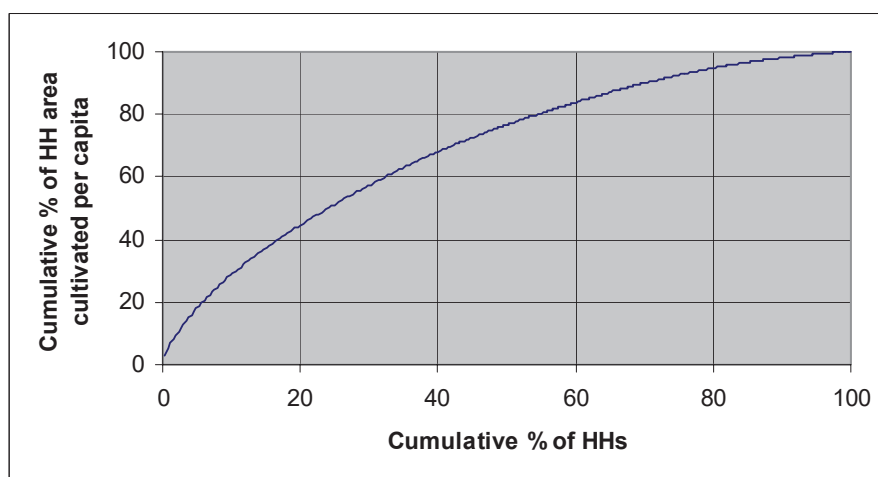
‘Access to land’ can be disaggregated into three key dimensions: hectareage owned or accessible (farm size), hectareage cultivated, and the proportion cultivated of hectareage owned. Zulu et al. (2000) found relatively high concentration of a fourth dimension, crop output (by value). Plotted on a Lorenz curve, it appeared that “80% of all households produced about 40% of the value of all the whole crop output. This means that about 60% of the value of crop output is produced by only 20% of farming households.” (Zulu et al., 2000: 29) A Lorenz plot (Figure 6.5) of our data from the 2000/2001 season (starting from the left with highest crop value households) shows a similar ratio:

Figure 6.5: Lorenz Curve, Concentration among households of Total Value per capita of crops



The highest 20% of households (on the left) account for 57% of the value of crop output, equating to a Gini coefficient of 0.537.¹⁴⁵ However, analysis already shows (Section 6.1.1.5) that planting cotton is a major determinant of crop value output. Is the distribution of household area cultivated per capita as skewed as that of crop value output? The Lorenz curve appears thus (Figure 6.6):

Figure 6.6: Lorenz Curve, Concentration among households of Area Cultivated per capita



¹⁴⁵ A higher Gini coefficient, up to a maximum of 1.00, indicates greater concentration.

This curve is slightly less bowed: the highest 20% of households account for 45% of area cultivated per capita (corresponding to a Gini coefficient of 0.393).

Per capita farm size is more concentrated than per capita area cultivated, unsurprisingly given the existence of large settlement farms in the sample. The highest 20% of households cumulatively have about 68% of land per capita (Gini coefficient 0.630). However it can be deceptive to compare State and customary farms in this way, because many State parcels include large individual grazing areas, whereas customary lands can be expected to have communal grazing areas that in this study are not counted as part of farm size. Anyway it is already clear that land concentration exists in this sample that purposefully comprises settlement and customary farms. The more interesting question is whether crop value output, area cultivated per capita, and total farm hectareage per capita are concentrated on customary land, because this is where equity might have been expected.

Limiting the sample to customary land, 20% of households account for 51% of per capita farm size (Gini coefficient 0.451). Concentration of per capita area cultivated is about the same (Gini 0.444), while that of crop value per capita is slightly greater, with 20% of households producing 56% (Gini 0.518). Table 6.18 summarises the Gini coefficients for all three variables:

Table 6.18: Summary of Gini Coefficients (Total farm size, area cultivated, total crop value, all per capita)

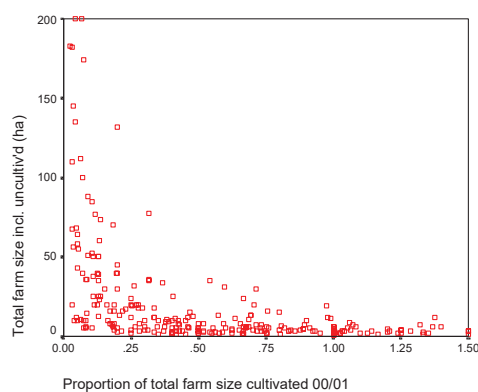
	TOTAL FARM SIZE PER CAPITA	AREA CULTIVATED PER CAPITA	TOTAL CROP VALUE PER CAPITA
State + Customary	0.630	0.393	0.537
Customary only	0.451	0.444	0.518

Comparing the whole sample (State plus customary) with the customary sub-sample, customary total farm size is less concentrated than the whole sample; customary per capita area cultivated is slightly more concentrated (perhaps surprisingly); and per capita crop output value is nearly the same. Within the customary sub-sample, total farm size and area under cultivation have near-equal concentrations, whereas total crop value is more concentrated than land itself. This suggests that, while the former two are indeed somewhat concentrated, the

higher concentration of the latter indicates unequal access to more costly inputs. Within the whole sample, per capita area cultivated is substantially less concentrated than per capita crop value and per capita farm size. This discrepancy suggests that access to land is not the only constraint on or determinant of area cultivated.

This raises the issue of the proportion cultivated of available or owned land. In this sample, cultivated proportion declines with increasing farm size, as illustrated by the bivariate scatterplot (Figure 6.7):

Figure 6.7: Scatterplot, Total farm size vs. Proportion cultivated of total farm size



(Proportions greater than 1.00 indicate that such households borrowed additional hectareage for the year in question, 2000/01.) The inverse trend is still visible if large farms (>15 ha) are excluded. So proportion of available land cultivated should be handled with care as an indicator: the owner of 200 ha who manages to cultivate 10% is still much better off than the owner of one hectare who cultivates 100%.

In the whole sample, median proportion of farm size cultivated is 47%, and mean is 57%. If only farms less than 15 ha are included, median is 69% and mean is 71%. If only those less than five ha are included, median is 83% and mean is 85%. So there is still under-utilised land (albeit only fifteen percent on average) even among small farms under five ha. Analysing proportion cultivated by quintile of per capita farm size, the lowest quintile of per capita farm size still cultivates a mean of only 87% (median 86%) of available land. The middle quintile of per capita farm size managed to cultivate a mean of 66%, while the highest quintile cultivated a mean of 13%. Despite the evident concentration of both farm size and area cultivated, the phenomenon of under-utilised land persists (at least in this study year, and declining to a small unutilised proportion among the smallest farms).

6.4.3 Determinants of area cultivated, proportion cultivated, and crop value per capita

6.4.3.1 Crop output value per capita

What then are the determinants of per capita area cultivated, proportion of available land cultivated, and crop output value per capita? The latter has already been analysed above in Section 6.1.1.5 (where it was termed ‘value-labour productivity’): its key determinants are ‘HH labour force’ (negative), ‘total area cultivated,’ ‘cotton’s proportion of area cultivated,’ ‘cattle ownership,’ ‘fertiliser use,’ ‘distance to market,’ ‘fixed investment,’ and ‘HHH holds lease’ (all positive). It is noteworthy that the association with total area cultivated holds even when cotton planting is controlled for, implying that the explanation goes beyond the possibility of larger farms attracting cotton out-grower schemes.

6.4.3.2 Per capita area cultivated

The next dependent variable of interest, ‘area cultivated per capita 2000/01,’ is transformed towards normality by square-rooting, as are some of the control variables (noted below). The model comprises dummies for land documentation categories plus the following variables:

- Farm size per capita (square root)
- Credit use (total value of loans received in last 5 years) (square root)
- Cattle total number (square root)
- Fixed investment (aggregate cost) (square root)
- Years since farm acquisition
- Distance to market
- HHH Age
- HH labour force
- HHH's highest school grade finished
- Use of animal or mechanical traction (binary dummy)

The resulting OLS regression (excluding four cases with outlying residuals) produces an R-squared of .258 (adjusted R-squared .208). There are no further cases with outlying residuals, and residuals plots are acceptable. (See Table 6.19, Column 1 for full regression results.) Variables with significant coefficients include: ‘Total farm size per capita,’ ‘Credit use,’ ‘Years since farm acquisition’ (negative coefficient), ‘Distance to market,’ ‘Use of animal or mechanical traction (binary),’ and ‘HH labour force’ (negative coefficient).

Conspicuous for its absence is ‘cattle ownership,’ especially as it was a consistent factor in different dimensions of productivity. It seems, from the simultaneous significance of the

Table 6.19: Regression results, determinants of area cultivated per capita

Independent Variables	Dependent Variable			
	1.		2.	
	Area cultivated per capita (square root)		Area cultivated per capita (sq.rt.) (customary land only)	
	Coefficients		Coefficients	
	B	Beta	B	Beta
(Constant)	0.414 (5.24)		0.314 (2.29)	
No document / State land	0.043 (1.16)	0.077		
HHH's relative holds lease	0.040 (0.88)	0.056		
HHH's relative holds title	0.084 (1.64)	0.105		
HHH holds lease	0.001 (0.03)	0.002		
HHH holds title	0.006 (0.13)	0.011		
HHH Age	-0.001 (-0.51)	-0.040	-0.002 (-1.03)	-0.133
HH labour force	-0.006 (-2.13)	-0.156 **	-0.007 (-0.82)	-0.093
HHH's education	-0.004 (-0.74)	-0.055	0.005 (0.61)	0.070
Total farm size (ha) per capita (square root)	0.083 (4.21)	0.302 ***	0.334 (4.61)	0.460 ***
Years since farm acquisition	-0.003 (-1.89)	-0.145 *	-0.001 (-0.30)	-0.038
Distance to market	0.005 (2.89)	0.180 ***	0.009 (2.53)	0.231 **
Number of cattle owned (sq.rt.)	0.002 (0.36)	0.028	-0.015 (-0.87)	-0.082
Use of animal or mechanical traction (binary)	0.137 (2.81)	0.171 ***	0.037 (0.41)	0.038
Fixed investments (aggregate cost) (ln ** 2.56)	0.000 (0.28)	0.022	0.000 (-0.30)	-0.034
Credit use (total value of loans last 5 years) (sq.rt.)	0.000 (1.80)	0.116 *	0.000 (0.62)	0.062
Observations	237		91	
Adjusted R-square	0.208		0.336	

Note: Numbers in parentheses are *t*-values.

*Significant at 10%; **Significant at 5%; ***Significant at 1%.

B coefficient = unstandardised, *beta* coefficient = standardised.

binary variable for use of traction, that many people are managing to borrow or hire oxen. (If the binary variable is removed from the model, the coefficient for ‘cattle ownership’ is still insignificant.) This is actually consistent with the attribution of cattle ownership’s effect on land and labour productivity (Section 6.1) to the reported importance of the timing of planting (and hence ploughing) to maize yields: common sense suggests that cattle owners who rent out or lend their cattle for ploughing (hence levelling area cultivated per capita between cattle owners and non-owners) would mostly do so only after ploughing and planting their own fields at the optimal time. In Pearson correlations, ‘cattle ownership’ does not correlate significantly with area cultivated per capita, but it does with farm size (both per capita and total) and with total area cultivated (not per capita). Essentially this means that more oxen do not have to be paired with more people, so to speak, to expand cultivation. If cases with more than 50 head of cattle are excluded, cattle ownership does correlate weakly with area cultivated per capita (Pearson’s $r = .122$, $p = 0.051$); however it remains insignificant if the above regression is performed excluding those cases. So the key variable (binary ‘use of animal or mechanical traction’) is perhaps best termed ‘access to traction,’ to emphasise that households without their own cattle who manage to borrow or hire traction still enjoy, plausibly enough, an associated greater area cultivated per capita—though probably not enjoying the advantage of perfectly-timed planting.

Regarding the other significant variables, the strong coefficient for ‘total farm size per capita’ is expected. The positive coefficient for ‘distance to market’ implies, plausibly, that remoter farms manage to cultivate more land per capita, though this appears not to be merely a function of more space available, as ‘total farm size per capita’ is controlled for. It may reflect a preference for extensive rather than intensive cultivation in those areas, possibly due to poorer soils or worse access to fertiliser. Area cultivated per capita declines as ‘Years since farm acquisition’ increase, which may be due to fallowing as soil fertility declines over years of use (though one might argue that farmers would respond to declining yields by expanding hectarage if possible). The causal mechanism for the positive coefficient of ‘credit use’ seems obvious: greater access to seed and fertiliser. The negative coefficient of ‘HH labour force’ recalls the declining marginal productivity of household labour in previous analyses, here plausibly implying that area cultivated per capita declines as household labour force increases.

If the sample is limited to customary land (Table 6.19, Column 2), however, the significant coefficients shrink to ‘farm size per capita’ (beta = .460, $p < 0.01$) and ‘distance to market’ (beta = .231, $p = 0.013$). Adjusted R-square meanwhile improves to .336. Surprisingly, neither of the cattle-related variables, nor ‘credit use,’ remain significant. It seems that the factors behind area cultivated per capita on customary land are more straightforward than in the sample overall, and that access to land (so far as it equates to farm size per capita) is indeed

the major determinant. This is plausible to the extent that settlement farms on State land are larger and therefore tend to have more available (unused) arable land. On customary land, then, there is no evidence with which to blame unequal area cultivated per capita on unequal access to traction or to credit.

If the sample is limited to State land, 'credit use' and 'distance to market' become insignificant; otherwise, the variables with significant coefficients parallel those in the regression on the whole sample.

6.4.3.3 Total area cultivated and proportion of total farm size cultivated

Similar regressions on 'total area cultivated' and 'proportion of total farm size cultivated' produce the same significant variables with the whole sample, except that 'years since farm acquisition' loses significance. For the customary land sub-sample, the significant variables are again fewer.

6.4.4 Conclusions on access to land

Table 6.20 summarises the results (all significant at 5% unless otherwise noted):

Table 6.20: Significant factors of crop value output, per capita area cultivated, total area cultivated, and proportion of total farm size cultivated

	Whole sample	Customary only
PER CAPITA CROP VALUE OUTPUT	‘HH labour force’ (negative) ‘Total area cultivated’ (positive) ‘Cotton’s proportion of area cultivated’ (positive) ‘Cattle ownership’ (positive) ‘HHH holds lease’ (positive) ‘Distance to market’ (negative) ‘Fertiliser use’ (positive) ‘Fixed investments’ (positive)	‘Fertiliser use’ (positive) ‘HH labour force’ (negative) ‘Cotton’s proportion’ (positive) ‘Distance to market’ (positive) ‘Total area cultivated’ (positive) ‘Cattle ownership’ (positive) ($p = 0.062$)
PER CAPITA AREA CULTIVATED	‘Farm size per capita’ (+) ‘Years since farm acquisition’ (-) Binary ‘Use of animal or mechanical traction’ (+) ‘HH labour force’ (-)	‘Farm size per capita’ (+) ‘distance to market’ (+)
TOTAL AREA CULTIVATED	‘Total farm size’ (+) ‘HH labour force’ (+) Binary ‘use of traction’ (+) ‘Credit use’ (+) ‘Distance to market’ (+)	‘Total farm size’ (+) ‘HH labour force’ (+) ‘Distance to market’ (+) ‘Credit use’ (+) ($p = 0.097$)
PROPORTION OF TOTAL FARM SIZE CULTIVATED	‘Total farm size’ (-) ‘Credit use’ (+) ‘Distance to market’ (+) ‘HH labour force’ (+) Binary ‘use of traction’ (+)	‘Total farm size’ (-)

The clearest distinction between the two columns is that neither of the cattle-related variables appears in the ‘customary only’ column except in relation to total crop value per capita: neither number of cattle owned nor access to traction correlate significantly with any of the other three outcomes on customary land. By contrast, for the whole sample (hence owing to the State land portion), cattle ownership or use of traction appears as a robustly significant factor for each of the four outcomes. At the smaller farm sizes with which the customary sub-sample generally corresponds, there seems to be a complex, probably non-linear relationship between cattle and cultivation, possibly involving threshold levels of area cultivated and oxen use. This is plausible in that a household would do whatever it must to cultivate a minimum hectareage for subsistence, hoeing by hand if necessary; but to graduate to greater areas cultivated per capita, access to cattle is needed or preferred.

For ‘per capita crop value output’ (arguably the most important of the four outcomes, as it is likely to relate directly to per capita incomes), the two columns share most factors. A greater difference appears in ‘per capita area cultivated,’ with use of traction and HH labour force not significantly affecting the outcome in the customary sub-sample as they do for the whole sample—again, possibly a threshold effect. Determinants of ‘Total area cultivated’ are similar between the two columns, but for ‘proportion of total farm size cultivated,’ the multiple determinants for the whole sample shrink to only ‘total farm size’ for the customary sub-sample.

Regarding access to land: because total farm size appears as a strong determinant of all four outcomes, unequal ‘access to land’ is indeed a key factor. But it is not the only determinant: credit use and access to traction stand out as key variables that are potentially susceptible to policy interventions (with ‘HH labour force’ and ‘distance to market’ being less mutable).

It should be noted that this study’s sample is not ideally suited to issues of land concentration, being focused on contrasting tenure regimes. This analysis is therefore intended to suggest future lines of inquiry, preferably with geographically broader data.

6.5 Income

Analysis of the components and determinants of household income serves less as a capstone of this thesis than as an epilogue. These data are sub-optimal for analysis of income, for several reasons. Single-year cross-sectional income data are vulnerable to multiple vagaries such as weather (which can vary even within the constricted study area); high revenues (e.g. from livestock sales) may actually be distress sales or otherwise anomalous; factor supply and prices are unstable (and in the case of FRA fertiliser on credit, the eventual price was not even announced at the time of supply). Nonetheless, an analysis of income is necessary because staple crop productivity (often taken as the end point of the model in previous studies, such as most of those presented in Bruce and Migot-Adholla 1994) is not the only outcome of interest to land tenure studies. It is also necessary to consider farm income aside from field crops, including livestock, tree crops, and horticulture *inter alia*. Moreover, it has been shown (Ch. 5 – Section 5.2, Ch. 6 – Section 6.1) that cattle ownership appears as a consistent correlate of intermediate outcomes (fixed investments, productivity). Therefore to carry the analysis through as the conceptual framework implies (Ch. 4) and to suggest possible future lines of inquiry, a brief analysis of income is presented. Table 6.21 shows median per capita income across land documentation categories (previously shown in Table 5.1).

Table 6.21: Median per capita household income across land documentation categories

	<i>Land Documentation Category</i>					
	No doc, Cust. Land	No doc, State land	HHH's relative holds lease	HHH's relative holds title	HHH holds lease	HHH holds title
<i>Median per capita HH income*</i>	56,952	130,694	64,680	140,042	171,179	279,084

**nominal 2001 kwacha*

Before regression analysis on the determinants of income, the structure of income within the sample is explored (components thereof in relation to income quintile and land documentation category).

6.5.1 Components of income per Land Documentation Category

Table 6.22 presents mean proportions of total household income contributed by revenue from or value of each major source—different crops, vegetables, livestock, and other sources (mostly small business such as kiosks or charcoal production).¹⁴⁶

Table 6.22: Mean (5% trimmed) proportion of revenue per source to total household income, by land documentation category and by tercile of income

Income Source	Overall Sample	<i>Land Documentation Category</i>						<i>Tercile of total HH income per capita</i>		
		No doc., cust. land	No doc., state land	HHH's relative holds lease	HHH's relative holds title	HHH holds lease	HHH holds title	Lowest tercile	Middle tercile	Highest tercile
<i>Local maize</i>	0.22	0.32	0.15	0.20	0.14	0.21	0.09	0.42	0.20	0.07
<i>Hybrid maize</i>	0.30	0.30	0.32	0.36	0.40	0.28	0.31	0.31	0.34	0.28
<i>Sunflower</i>	0.01	<0.01	0.04	<0.01	0.01	0.03	0.02	0.01	0.02	0.01
<i>Cotton</i>	0.11	0.06	0.16	0.15	0.16	0.18	0.06	0.02	0.12	0.18
<i>Groundnuts</i>	0.05	0.07	0.04	0.07	0.04	0.07	0.03	0.10	0.06	0.03
<i>Sweet potatoes</i>	0.03	0.06	0.02	0.03	0.02	0.01	0.03	0.07	0.03	0.01
<i>Vegetables</i>	0.03	0.02	0.01	0.04	0.07	0.03	0.03	0.01	0.03	0.03
<i>Livestock</i>	0.12	0.06	0.10	0.20	0.12	0.18	0.20	0.07	0.09	0.21
<i>Other</i>	0.08	0.05	0.14	0.09	0.12	0.06	0.08	0.01	0.11	0.12

¹⁴⁶ Revenues per source are used rather than profit per source, because reported costs could not all be assigned to a particular income-generating activity (most notably fertiliser—data were not gathered on how much fertiliser was applied to each crop). The statistic used for each proportion is the 5 per cent trimmed mean. It was necessary to trim the highest and lowest five per cent because in some cases these were less than zero or greater than one. Such cases occurred because, in the case of crops, the numerator was crop value or revenue—not subtracting fertiliser and other costs—whereas the denominator was income net of such costs. Hence in cases of e.g. heavy fertiliser use with poor yields, net income becomes small or negative relative to the crop value, and the ratio (proportion) becomes negative or greater than one. Trimming these outliers allows a fairer appraisal of central tendencies; it does however exclude from the analysis those whose input costs were disastrous relative to their crop values.

Among the land documentation categories, hybrid maize has the largest proportionate contribution to income in each category except ‘no document, customary land.’ The proportional contribution of local maize to income is highest in the category of ‘no document, customary land’ and generally declines across categories thereafter. Cotton is most important to leaseholders and least so to titleholders and customary-land farmers. Titleholders, leaseholders, and relatives of leaseholders have the highest proportion of livestock income; and ‘No document, State land’ and ‘HHH’s relative holds title’ have the most significant ‘other’ income, which carries the interesting suggestion of non-agricultural specialisation, or diversification of income sources, on the least secure land.

The sample is also divided into terciles of per capita HH income in order to show the important sources of income for low, middle, and high income groups (Table 6.22, rightmost columns). For the low and middle terciles, local maize and hybrid maize are the main earners; for the high-income tercile, hybrid maize is the single most important. The high-income tercile also clearly benefits more than the rest (proportionately, and hence absolutely as well) from cotton and livestock revenue, and (along with the middle tercile) from ‘other’ activities. Therefore, across land documentation categories and income terciles, maize production is indeed important to incomes; so are livestock income and access to cotton production and other income sources.

6.5.2 Determinants of Income

For regression, the awkward distribution of the variable for household income per capita aged 12-64 (heavily skewed towards low values, with a tail of high values), which persists after square-rooting or taking the natural log, necessitates its transformation into normality with the Blom ranking function.¹⁴⁷ Independent variables comprise the same list used for regressions on total crop value (Section 6.1.1.5), plus ‘total farm size per capita’ and ‘hybrid maize’s proportion of area cultivated.’ Also, ‘area cultivated’ and ‘fixed investments’ are now in per capita terms (per HH resident aged between 12 and 64). Four cases with outlying residuals are excluded. An OLS regression produces acceptable residuals. Adjusted R-squared is .388, indicating moderate explanatory power. Variables with significant coefficients (see Table 6.23) include (in descending order of absolute value of the standardised coefficient): cattle ownership, area cultivated per capita, cotton’s proportion, hybrid maize’s proportion, credit use (negative), HHH holds lease, fertiliser use (negative), HHH holds title, fixed investments per capita, and ‘no document / State land.’

¹⁴⁷ ‘Creates new ranking variable based on proportion estimates that uses the formula $(r-3/8) / (w+1/4)$, where w is the sum of the case weights and r is the rank.’ (SPSSv.10)

Table 6.23: Regression results, determinants of HH income per capita

<i>Independent Variables</i>	<i>Dependent Variable</i>	
	HH income per capita aged 12-64 (normalised with Blom)	
	<i>Coefficients</i>	
	B	Beta
(Constant)	-0.817 (-2.75)	
No document / State land	0.266 (1.82)	0.105 *
HHH's relative holds lease	-0.147 (-0.81)	-0.046
HHH's relative holds title	0.165 (0.79)	0.044
HHH holds lease	0.378 (2.27)	0.147 **
HHH holds title	0.336 (1.66)	0.122 *
HHH Age	-0.005 (-1.26)	-0.090
HH labor force	0.004 (0.35)	0.023
HHH's education	-0.010 (-0.55)	-0.035
Parents' wealth index	0.038 (1.10)	0.061
Total Area (ha) cultivated per capita (sq.rt.)	0.998 (4.24)	0.254 ***
Total farm size (ha) per capita (sq.rt.)	0.052 (0.61)	0.040
Years since farm acquisition	-0.001 (-0.24)	-0.016
Distance to market	-0.001 (-0.09)	-0.005
Fertilizer use (total kg per ha 00/01) (sq.rt.)	-0.018 (-1.90)	-0.123 *
Number of cattle owned (sq.rt.)	0.121 (4.45)	0.304 ***
Cotton's proportion of area cultivated 00/01	1.257 (4.08)	0.222 ***
Hybrid maize's proportion of area cultivated 00/01	0.580 (3.61)	0.201 ***
Fixed investments (aggregate cost) per capita (sq.rt.)	0.000 (1.85)	0.110 *
Credit use (total value of loans last 5 years) (sq.rt.)	<0.001 (-2.58)	-0.176 **
Observations	236	
Adjusted R-square	0.388	

Note: Numbers in parentheses are *t*-values.

*Significant at 10%; **Significant at 5%; ***Significant at 1%.

B coefficient = unstandardised, *beta* coefficient = standardised.

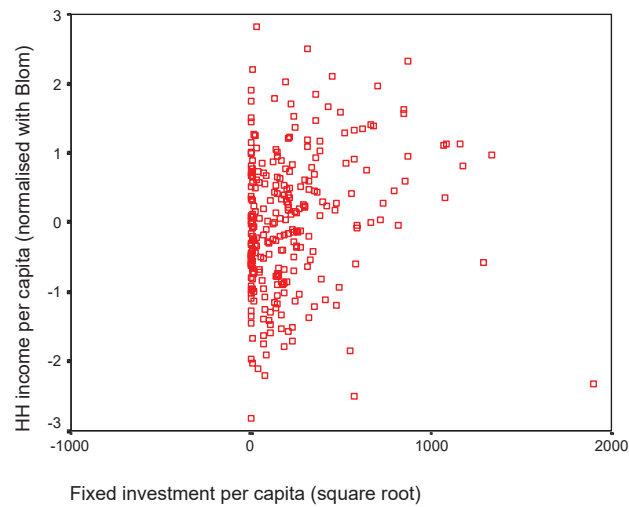
These results contain some interesting indications. Fertiliser use's negative coefficient suggests its non-profitability, at least in the conditions prevailing in the study year.¹⁴⁸ Credit use's negative coefficient is probably linked to the fact that fertiliser is the major item supplied on credit. The profitability of planting cotton and hybrid maize is plausible, as are the income gains associated with greater area cultivated per capita. Cattle ownership again emerges as a key correlate.¹⁴⁹ The reason for the advantage of lease- and title-holders (and, anomalously, those without document on State land) is not clear, as cotton, hybrid maize, and cattle are all controlled for. Referring back to sources of income (Table 6.22, in Section 6.5.1 above), the category of 'no document / State land' earned a greater proportion of income from 'other' sources than any other category, which may explain that category's significance in this mainly agronomic model in which recourse to 'other' sources is not otherwise represented. Fixed investments emerge as a correlate of income, consistent with their relationship with labour productivity (Section 6.1.1.5). The scatterplot of fixed investment against per capita household income (Figure 6.8) affirms a generally diagonal trend. Indeed, since the investments must have temporally preceded income for the previous 12 months (except for the handful installed in the study year), it is safe to call them a cause (direct or indirect) of income. Since fixed investment is already shown to be associated with land tenure (Ch. 5, Section 5.2.3), these results suggest a causal path by which tenure — through fixed investments and labour productivity — influences income.

Hybrid maize yields (not just proportion of cultivated area planted with hybrid maize) also affect income. If the regression is repeated with this variable added, the number of observations shrinks to 144, because households not growing hybrid maize are necessarily excluded. For those remaining, hybrid maize yields (kg/ha) had the strongest standardised coefficient value of any. Otherwise, most of the significant variables from the previous regression remain, the exceptions being 'HHH holds lease' and 'cattle ownership,' which now miss significance by a wide margin. It seems that the income of hybrid maize growers, plausibly enough, mainly depends on yields for that crop. Also, despite previous suggestions in this thesis that staple crop productivity may be overrated as an outcome of interest, this result suggests that it does indeed strongly affect income.

¹⁴⁸ Recall that the derivation of household income subtracted costs (or value) of inputs including fertiliser, which was often the largest input expenditure. Farmers also often complained about the poor quality or condition, or inappropriate types supplied, of fertiliser, and also that it was prone to be washed away by heavy rains.

¹⁴⁹ This likely derives from cattle's demonstrated effect on productivity of land and labour, as well as from possible other income generation with cattle (such as dairy and renting out traction). Selling and slaughtering would reduce herds as they increase income; however the positive association with income would also occur under the plausible condition that it be mostly owners of large herds that sell or slaughter some cattle, and that the unit price received be high enough to substantially boost income while reducing herd size by only a small proportion.

Figure 6.8: Scatterplot, fixed investment against per capita household income



6.5.3 Conclusions on Income

Titled and leased households have the highest and second-highest median household income per capita. They earn higher proportions of their income through livestock than do other land documentation categories. Determinants of income include proportion of cotton and hybrid maize planting, titles and leases as well as being on State land without document, area cultivated per capita, cattle, fixed investments (importantly for this study, as they correlate with land tenure and labour productivity), and fertiliser or credit use (negative). Hybrid maize yields, for those who grew it, strongly influence income.

It should be conceded that modelling income is a more complicated undertaking than the foregoing. These results are therefore indicative rather than definitive. However the analysis is worthwhile in that this thesis concerns the proximate effects of land tenure, and this section serves to suggest mechanisms by which these effects may in turn influence outcomes relevant to poverty alleviation.

Chapter 7: CONCLUSIONS

7.1 Results with respect to objectives and hypotheses

The objectives of this study were to identify and measure the effects of land tenure on farming and socio-economic performance, in a zone that is broadly characteristic of southern African farmland, with particular attention to comparing statutory and customary tenure, as well as variations of tenure within each. These objectives arose from the context of a long-standing developmental debate about the relative merits of statutory and customary tenure for small farmers in sub-Saharan Africa—an old debate that gained new immediacy through the 1990s with a series of land tenure reform laws across southern Africa, alongside agonised processes of land redistribution in some countries in the region. The debate, epitomised by a series of empirical studies (many presented in Bruce and Migot-Adholla, 1994) and concurrent theoretical or deductive work (cited in Ch. 2), seemed to be reaching a consensus that tenure and its reform were not nearly as relevant to SSA farmers as it had been shown to be in other regions (e.g. southeast Asia). However, it was argued in Ch. 2 that there was still room to search for the effects of tenure with modified methods and a finer theoretical focus.

This study's methodological approach and analysis were predominantly quantitative, but the survey also captured substantial data on perceptions and preferences, which are necessary to interpret the effects on incentives of current and putative tenure and agro-economic regimes. For practical reasons mainly stemming from the opportunity to re-visit a previously surveyed sub-sample, the 'household' was chosen as the unit of analysis, at some risk of overlooking inter- and intra-household phenomena (especially possible differential welfare outcomes within the household and between genders), and of analysing a unit that may be ill-defined. The conceptual framework focused on household socio-economic characteristics, farming practices, land tenure, and farm characteristics, inputs, assets, investments, and outputs; the detail obtained in these areas may have been to the detriment of examining and accounting for the possible effects of social relations on the factors and outcomes of interest.

The hypotheses and results are tabulated in Table 7.1:

Table 7.1: Summary of Hypotheses and Results

HYPOTHESIS	SUB-HYPOTHESES	RESULTS
HYPOTHESIS A: Farmers with greater tenure security have accumulated greater fixed investment on their land.	<i>A.1. Farms on State land have greater mean fixed investment than farms on customary land.</i>	Supported.
	<i>A.2. Farms on State land that have titles, have greater mean fixed investment than farms on either State or customary land that do not have titles.</i>	Supported: fixed investment among title-holders differs significantly from that of categories of lesser or no documentation, even controlling for socio-economic advantages. Title-holders had greater investment than lease-holders within the sample, though with marginal significance.
HYPOTHESIS B: Farms with greater tenure security have greater productivity of field crops.	<i>B.1. Farms on State land have greater productivity (per hectare and per unit labour) than farms on customary land.</i>	Partially supported: Farms on State land do have significantly greater local maize yields and total crop value (per unit land and labour) than customary-land farms; hybrid maize yields did not differ significantly.
	<i>B.2. Titled farms have greater productivity than untitled farms on either State or customary land, through intervening socio-economic and agronomic variables.</i>	Partially supported: without control variables, titled farms differ (with fluctuating significance) from untitled farms in hybrid and local maize yields; they differ significantly in total crop value per ha. Title-holders lead significantly in hybrid maize production and total crop value per unit labour; however, lease-holders lead local maize labour productivity. In regressions on a full model of intervening factors, title <i>per se</i> is not associated with significant differences in land or labour productivity of maize or total crop value. However, at least one variable associated with title—fixed investments—does influence some aspects of productivity.
HYPOTHESIS C: Farms with greater tenure security have higher credit use than farms with lesser security.	<i>C.1. Titled farms have higher credit use than untitled farms.</i>	Supported: farms under title or lease have greater credit use. Addition of control variables to the model shows that the causal mechanism operates via household labour force, cattle ownership, total farm size, and (with one regression method) distance to market, indicating that these are more proximate causes.

HYPOTHESIS	SUB-HYPOTHESES	RESULTS
HYPOTHESIS D: Children of farm households with greater tenure security have different socio-economic trajectories.	<i>D.1. Children of titled households have higher educational attainment.</i>	Supported: Children of title-holders have greater educational attainment, compared to those without document on State or customary land, even controlling for socio-economic variables. Children of lease-holders, however, do not differ significantly. The greater rate of grade completion of title-holders' children emerges at or above the 9 th grade level; at the 7 th grade level, there are no significant differences.
	<i>D.2. A greater proportion of children of such households obtain salaried jobs.</i>	Supported: Title-holders are more likely to have at least one salaried worker among offspring. Regression makes clear that this is due to the intervening mechanism of offspring's education, which is higher among title-holders, and which facilitates salaried work.

Additional findings were presented on access to land and determinants of income. Land was found to be somewhat concentrated even on the customary-land part of the sample, and thus a constraint on production for households with the least land; however simultaneous constraints on inputs (especially animal traction) limited the area under cultivation as a proportion of total available area per farm, even among the smallest farms. Income is most strongly determined by cotton and hybrid maize planting, titles and leases (as well as, anomalously, being on State land with no document), cattle, fixed investments, and (negatively) by fertiliser use or credit use. (The study is limited by the absence of measurement of intra-household distribution of land, income and labour.) Hybrid maize yields, for those who grew it, strongly influence income.

The general research question was, do different land tenure conditions affect farming systems, organisation and performance among small and medium-sized farmers in Zambia's Southern Province, and if so, how? These results argue strongly that tenure does indeed affect farming in the study area, and they contribute some clarification as to how. Fixed investments are indeed associated with greater tenure security, and in turn contribute to some aspects of field crop productivity; they also appear to facilitate cattle husbandry (especially in the form of wells, dams and fencing). Therefore, via these two causal paths, fixed investments may be said to boost income. State-land households (especially title- and lease-holders) have higher yields and productivity than customary households (though not always by a wide enough margin to generalise beyond the sample), through the intervening mechanisms of fertiliser use,

cattle, and credit use including access to high-yield inputs like hybrid maize seed or ability to cultivate high-value crops like cotton. Land tenure has inter-generational effects, with title-holders' children showing better educational attainment and a higher proportion entering salaried jobs. On the distributional issue, land is indeed fairly concentrated even on the customary part of the sample, but area cultivated is less so, and not all available land was cultivated in the study season even among the smallest farms. This indicates that there are important short-term constraints to farm output aside from access to land, as indeed the respondents pointed out.

7.2 Policy Implications

The policy implications of this study's findings can be summarised in three key points:

1. Tenure security affects farmers and farm performance in Zambia.
2. Zambia needs land tenure reform on at least four levels: (a) for State land, creation of stronger tenure instruments than non-transferable long leases; (b) better administration of such instruments so as to make them cheaply, quickly and transparently available, thus counter-acting tendencies towards concentration of titled land; (c) aggressive promotion of gender equality in: testacy; access to land, tenure instruments and farming inputs including credit; and tenure security following widowhood or divorce; (d) exploration of ways to respond to the demand, where expressed, for 'titles' (or more generally, for better tenure security) on customary land aside from simplistically replacing customary with statutory tenure.
3. Rebuilding livestock herds is critical to rebuilding rural livelihoods in Southern Province. (If land tenure reform can no longer be seen as a magic bullet for rural development, perhaps cattle should be so seen, at least in this study area.)

Regarding statutory versus customary tenure, careful appraisal of the results yields at best ambiguous support to any notion of supplanting customary tenure with statute (at least as statute is currently administered). Farmers without documentation on State land did not perform better than their counterparts on customary land. It is therefore not the fact of being on State land that is associated with better farm performance, but the fact of possessing documentation. A programme that extends statutory tenure onto customary lands without automatic (hence equitable), fast and easy granting of tenure documentation will achieve the worst of both worlds: it will increase insecurity on customary lands while keeping farms as yet without documentation under their full potential. Perhaps needless to add, any process in

which the official granting of an advantage is discretionary and obscure is likely to engender non-transparent outcomes, to the detriment of most. Until land administration is working smoothly and accessibly, imposing it on customary lands with hitherto largely self-regulating tenure systems is likely to be counter-productive.

The current under-utilisation of customary lands as well as settlement parcels in this heartland of Zambian maize farming also suggests critical shortages of inputs apart from land (which is no news to those who are up to date with Zambian agricultural issues). Cattle's consistent association with various dimensions of farm productivity and income¹⁵⁰ argues for urgent programmes to re-build herds decimated in the past decade, as well as revival of veterinary services. The flurry of credit provision by FRA in the election year of the study is unlikely to be sustained, so the problem of providing seasonal credit to small farmers is still unresolved.

As a practical matter, State land in Southern Province contains a significant amount of farmed but untitled prime land, so any tenure reforms with an objective of improving aggregate production should start there rather than attempting to transform surrounding customary lands. It seems unacceptable that long-established farmers who rely on the national polity for their tenure security should continue to labour under short-term arrangements or no legal arrangement at all. The obvious remedy is an accelerated programme to grant title to settlement farmers who have been in place for a certain number of years. (Experience suggests that it is difficult to design a tenure that benefits all needy categories at once, if only because interests differ. Nonetheless, the undesirability of recommending a reform that benefits only the second-least-needy segment of this sample—leaseholders—must be conceded.) However such an effort would be complicated by the phenomenon of extended-family investment in settlement parcels: there are competing claims even on State land. To put it in economic terms, there are efficiency problems of withholding titles, but equity problems of giving titles to settlements' principal occupants thereby neglecting sub-lessees, invitees, and extended-family co-investors. A properly transparent process will have to be devised to balance such claims. The role of invitees and renters should also be aired: a rental market for sub-divided settlement parcels may be a useful and equitable part of access to land in the study area, but the history of prohibition on renting out land has driven it underground, which will have to be reversed if future policy is to be discussed openly. Generally, Zambia's inherited bifurcation between State and customary land can be turned to advantage: State land can provide an arena

¹⁵⁰ Indeed, the plausibility of such strong and consistent associations between cattle and a variety of farming outcomes might be questionable, were it not for the foregoing work (discussed in Ch. 3, Section 3.4) by Deininger and Olinto (2000) and Bangwe (1997) which presaged these findings.

for emergent commercial farming, while customary land provides secure subsistence governed by local structures.

Land tenure reforms must be an outgrowth of actual farmer preferences, not undertaken in the hope of changing preferences. The voting by this study's respondents on the importance of specific land rights shows that most are unwilling to enter transactions of the types (sales, mortgaging) that form part of the economic rationale for tenure reform. (It also shows, on a methodological point, that such preferences are not hard to ascertain.) The trouble and expense of activating land sale markets and mortgage-based credit markets is unlikely to be gainful (certainly not on customary land and probably not on settlements) if the findings of this study—resounding aversion to land sales and mortgages—hold for Zambia generally.

The 99-year lease as a substitute for freehold in Zambia originated in a colonial policy of retaining state control over prime farmland, a policy that was extended under UNIP. The long lease ('title') appears to provide tenure security in the basic sense of preventing dispossession, and in our study is associated with significantly higher levels of investment than undocumented farms. But in the critical dimensions of securing credit and stimulating efficient land markets, there is no reason to assume its functional equivalence to freehold (even when the 1995 Land Act allowing land sales is implemented). Conceptually it is a compromise between tenure security and state intervention, but is it a sensible one? Its rationale would seem to be to allow the state to repossess and if necessary re-distribute land, and to optimise land use; but if the state really needs to act on such social goals, 99 years is too long to wait. Repossession can be provided for under freehold by laws for eminent domain or mandatory purchase, and productive land use can be encouraged by well-administered land taxes. The subtext of long leases is that the state chooses to withhold ultimate tenure security; yet the length of the lease means that the state by its own rules cannot put this option to good use in our lifetimes. It sends a signal of insecurity for no practical purpose.

7.3 Contribution to Knowledge and Literature

This study builds on the advice of Place et al. (1995), for whom "The relationship between tenure, grazing, livestock management, land use, land investment, and market access [*in Zambia*] are crucial to understanding the effects of land policy interventions...[and] represent key issues for future research." (Place et al., 1995: 171) The study aims to integrate a full causal flow from inter-generational antecedents to a range of outcomes of interest. The sample design and study area were carefully chosen to illuminate tenure issues, obtaining good

variability in the key independent variable (tenure) combined with a geographical focus to minimise unmeasured variation in factors like rainfall, soil quality, and market access. The survey recorded opinions and perceptions to identify sources of insecurity and other land problems, their effects on farming, their importance relative to other constraints, and how respondent preferences are likely to manifest themselves in any changed tenure regime.

The study addresses recently raised issues of equity in access to land (Zulu et al., 2000), suggesting that while access to land is indeed concentrated and linked to unequal incomes, the problem might be more quickly addressed in the short term by remedying unequal access to complementary inputs (high-yield seed or seed for high-value crops, fertiliser, animal traction).

This thesis differs from some recent studies in other countries (Deininger et al. 2003, Brasselle et al. 2002, Place and Otsuko 2002) in that it does not test for endogeneity of land rights vis-à-vis fixed investment with econometric methods. However it did collect more detailed data than those studies on the timing of fixed investments and of tenure changes, allowing a ‘before-and-after’ analysis (Ch. 5, Section 5.2.3.7). The roughly even split between investment before and after obtaining a lease or title (somewhat greater before obtention) suggests that both postulated causal sequences occur: (a) investments are undertaken in some cases in order to enhance tenure security; and (b) enhancing security by obtaining lease or title is followed by greater investment in other cases. (This in turn suggests that the endogeneity question should not start from a false dichotomy, that endogeneity either holds sway or does not exist.) The fact that most cases had investment either before or after obtention, but rarely both, suggests at least that document obtention is a signal event.

This study also presents findings that differ, with potential substantive importance, from the majority of studies presented in the landmark empirical publication on land tenure and farm performance in SSA (Bruce and Migot-Adholla, 1994—see Ch. 2), which found that even in the cases where tenure security was associated with greater fixed investment, the investments did not in turn boost productivity (staple crop yields). While this study’s results contradict that—fixed investments did associate with some dimensions of productivity—it was also shown that fixed investments’ association with increased income likely operates in part through the investments’ uses for cattle husbandry. It was argued that staple crop yields need not be the only outcome of interest in economic analyses of the effects of land tenure (see Ch. 6, Section 6.1.3), and indeed this finding of a causal path through which tenure affects income via fixed investment (as well as via yields) supports the argument. (At the same time, hybrid maize yields, not just proportion of farmland cultivated with hybrid maize, was a strong

determinant of household income among hybrid maize growers—so staple crop yields and their determinants are still relevant.) Generally, so far as the studies presented in Bruce and Migot-Adholla (1994) give the impression that tenure makes little difference to SSA farm performance in practice, the results of this study contradict that: tenure, even without the key causal conduit of land-based mortgaging systems, does affect farm performance and incomes.

The ‘voting’ exercise on the relative importance of specific land rights (Ch. 5, Section 5.1.2.4), and the clarity of its verdicts, suggests a method by which land problems and potential solutions can be diagnosed in a context-specific way, similar to previous empirical identifications of a ‘jump’ in agricultural indicators at specific junctures of tenure (Ch. 2, Section 2.14).

An incidental finding, though one directly relevant to the debate about the putative productivity advantages of small farms and hence of land redistribution (Section 2.2), is that the hypothesised inverse farm size / productivity ratio does not hold in this sample: larger farms were on average more productive per unit land and labour.

Regarding the deductively and empirically determined reasons why the neo-classical model’s hypothesised effects of land tenure on productivity are not seen to work in SSA (Ch. 2, Sections 2.5 – 2.15):

1. *Mis-diagnosis of individual insecurity under customary tenure:* This study found that no single customary tenure status (as represented by mode of acquisition, e.g. matrilineal vs. patrilineal) was superior to the others in terms of stimulating fixed investment, and that investment on customary-land farms was slightly greater than that of undocumented State-land farms (within the sample, though without statistical significance). This suggests that customary tenure is not too insecure to allow investment. However, a widespread desire for title even on customary land does evince some dissatisfaction with customary tenure, or perhaps (in the interpretation of Berry, 1993, and Shipton and Goheen, 1992) a strategy of adding new assurances on top of old.
2. *Differential effects of transfer rights and tenure security:* This could not be adequately tested with these data, because transfer rights (even on State land) were not formally

recognised nor frequently practised.¹⁵¹ The lack of formal (long-term) credit supply even to titled medium-sized farmers indicates non-tenurial problems in credit markets, but also tends to support a hypothesis that weak transfer rights cause weak credit supply. The data did show the predicted effects of tenure security *per se* (i.e. duration and assurance of rights, as distinct from transfer rights) to hold: fixed investments were associated with stronger documentation.

3. *Low demand for credit:* With qualitative data (sometimes quantitatively tabulated, as with the land rights voting and the expressed demand for credit under different conditions of collateral), these results support the cautions voiced by Shipton and Goheen (1992) and Platteau (2000) cited in Ch. 2, Section 2.10, explaining why the rational smallholder is averse to the risks of borrowing with land as collateral. Such low credit demand, compounded with low supply, can be expected to continue to disturb the causal chain by which tenure affects productivity (or incomes) through credit.
4. *Land market activation:* This was not tested (nor has it been in previous studies), as the rural land market in the study area is largely inactive (see point 2 above).
5. *Technology:* Despite the plausible suggestion (Platteau 1996; see Ch. 2, Section 2.12) that advantageous technology may not be available in every study area, this study found that a variety of investments were practised, and though the most popular do not relate directly to field cropping, they do associate with cattle ownership and productivity, and hence with incomes.

Finally, in an era when redistribution and resettlement of land under statutory tenure is one of the most agonised issues in the southern Africa region, the study finds that the weakness of statutory tenure regimes in settlements (whether by design or by misadministration) bears a cost to the farmer, with no evidence of a corresponding gain to the state—the definition of a dead-weight loss.

7.4 Limitations

The study has the following key limitations that suggest improved methods for future research:

¹⁵¹ As mentioned, the 1995 Lands Act that undoes the ban on land sales (from the 1975 Conversion of Titles Act) had not yet been implemented in the study year, in the sense that new regulations had not been published or enacted.

1. The use of a single unit of analysis, the 'household' (as defined for previous surveys), in an area where both inter- and intra-household productive relationships and resource flows may be significant and, if analysed, reveal different patterns than a household-based analysis (and shed more light on possible differential welfare outcomes within the household, e.g. between the genders);
2. A low degree of emphasis in the conceptual framework and data on possibly influential social structures and relations such as polygamy and kinship, with the consequent likelihood that these factors, patterns and effects are under-reported in this study;
3. A narrow geographical focus, which allowed in-depth local contextualisation, but thereby sacrificing the ability to confidently generalise on the national and regional level;
4. A streamlined method of measuring income less sophisticated than those used in studies of which incomes are the focus;
5. Reliance on respondent reporting of field hectareage and crop outputs, which sacrificed some certainty about measurements and derivations depending on them (e.g. yields), in exchange for more survey time spent on other issues (perceptions and preferences, fixed investments, etc.);
6. Imperfectly random sampling of the State (settlement) stratum, for lack of updated sample frames, which in turn stemmed from popular reluctance to reveal the extent of settlement sub-division (and presumably sub-rental);
7. Data are a single-year cross-section that is vulnerable to short-term distortions that may disguise long-term trends. Distortions may be both macro-level (e.g. weather, vagaries of input supply, election-year politics) or household-level (e.g. illness, off-farm employment). Also, predicting benefits of improved tenure security on the basis of cross-sectional data amounts to predicting a dynamic process through a static lens. A more longitudinal study would allow firmer conclusions;
8. Incomplete analysis of the question of endogeneity, i.e. whether investments are made in order to secure land rights, rather than secure land rights leading to greater demand for investments (although all recorded respondent comments described the latter, not the former).

7.5 Future Research Needs

For Zambia, the nation-wide research structure mobilised for the annual Post-Harvest Surveys should be taken advantage of to investigate land tenure, fixed investments, and farm

productivity with a much broader sample and a longitudinal dimension. The survey instrument should incorporate a refined and expanded section on land tenure, informed by instruments developed for specialised land tenure studies, and by criticisms of the ‘household’ as a unit of analysis (Section 2.16). Away from large-scale quantitative surveys, there is likely to be value in detecting and exploring innovations in customary tenure that may respond to the expressed desire for titles or security without disrupting the advantages of customary allocation and tenure.

On methodological matters, the fact that fixed investments correlate with cattle husbandry (and indeed their common types implied a relation thereto) as well as with most dimensions of land and labour productivity suggests that focusing on maize yields or even broader measures of field-crop productivity would have missed important phenomena in this mixed-farming study area. The fact that this study found a firmer association between tenure security and fixed investments than some previous studies likely owes to the more powerful analysis allowed by aggregation of investment by value (and by points as a double-check), rather than weaker measurement methods like binary occurrence or non-occurrence of individual investment types. Sampling a broad spectrum of tenure statuses that comprises customary tenure as well as weak and strong statutory tenure improves the epistemological impact of the findings on the long-standing question of whether SSA farmers respond to security and other aspects of tenure. (The fact that the ‘strong’ tenure in this study area, as in Kenya, does not confer all of the attributes necessary to activate the property-rights logic tends to underline the substantive significance of the distinctions that nonetheless emerge.) Historical selection of settlement farmers, self-selection of titleholders (through the system of titling on demand), and possibly mixed directions of causality between tenure and fixed investment remain concerns in this study area as in most other SSA settings, though they can be controlled for to an acceptable degree. Regarding the latter possibility, examining investment behaviour before and after obtaining documentation (with a suitably large purposive sample) may be a promising way to elaborate the relationship. Longitudinal productivity data promise to be better indicators of trends than single-season cross-sectional snapshots. Finally, inert land markets and absence of mortgage-based credit markets in the study area precluded testing those components of the property-rights model; though again, the evidence of direct and indirect effects of tenure on productivity and income even in the absence of these factors seems noteworthy.

One senses that part of the appeal of land tenure reform for the development strategist has been that, like other aspects of ‘getting the institutions right,’ it seemingly can be enacted at the central level, almost at the stroke of a pen, in contrast to more diffuse and potentially tedious

developmental activities that must be designed, implemented and administered at the local level, such as education, health and rural infrastructure. But the paradox that tenure reform efforts have encountered, and that research is making increasingly clear, is that it cannot be accomplished – at least not with the desired effects – at the stroke of a central pen. It too must be developed and administered diffusely, on the ground, with all the cost and tedium that that entails (and all the risks of derailment or appropriation by locally powerful interests), if it is to achieve the goals of equity and efficiency.

It is important to avoid facile conclusions in favour of what might be taken as either privatisation or statism, at a time when land reform has already become violently contested in Zambia's vicinity. Also, prudence regarding land tenure reform's use as a tool with which to engineer agrarian economic growth is well justified by the historical record, which shows that reforms presented as neutral economic tools can be manipulated to deepen inequities. But the large-scale resettlement processes, involving various dynamics, that seem inexorable in southern Africa (and not just in Zimbabwe: in Angola following wartime displacement, in South Africa post-apartheid) require tenurial as well as distributive decisions. These findings from some of the areas of Zambia's own gradual resettlement exercise contain little indication that customary tenure should be heedlessly replaced by state tenure on economic grounds: being on state land *per se* is an insufficient condition for increased fixed investment, credit, cattle and productivity. Nor should they encourage belief that land tenure reform is a magic bullet in the SSA context, to be fired at agricultural stagnation and rural poverty. However, they do evince that, where statutory tenure already holds sway, there is a discernible economic cost to the tenure insecurity caused by withholding documentation from farmers. This implies both tenure reform (issuing stronger instruments than non-transferable long leases) and governance reform (making better use of existing and putative future instruments). Insofar as this study shows a causal path from tenure security to productivity and income, it argues that carefully designed, transparently derived, empirically-based tenure reform has a place in the hierarchy of needs, and therefore that there is still room for land tenure reform on the anti-poverty policy and research agenda.

REFERENCES

- Action by Churches Together (2002) *Zambia - ACT: 14-Jan-02 (Zambia - Assistance to Refugees AFZA-21 Appeal)*. Geneva: Action by Churches Together.
- Adams M. (2003) *Land tenure policy and practice in Zambia: issues relating to the development of the agricultural sector* (Draft report for DfiD, by Mokoro Ltd., contract no.: DCP/ZAM/018/2002.) Oxford, U.K.: Mokoro Ltd., pp. 70.
- Adams M. (1995) *Land Reform: New Seeds on Old Ground?* London: Overseas Development Institute.
- Adams M., B. Cousins, and S. Manona (1999) *Land Tenure and Economic Development in Rural South Africa: Constraints and Opportunities*. London: Overseas Development Institute.
- Agarwal B. (1994) *A Field of One's Own: Gender and Land Rights in South Asia*. Cambridge: Cambridge University Press.
- Allan W. (1965) *The African Husbandman*. Edinburgh and London: Oliver and Boyd.
- Anderson A. B., A. Basilevsky, and D. P. J. Hum (1983) *Missing Data: A Review of the Literature*. In Rossi, P. H., J.D. Wright, A.B. Anderson (ed.): *Handbook of Social Research*. London: Academic Press.
- Araki M. (1997) *Women's Clubs, Associations and Other Relations in Southern Zambia: Interactions between Development Interventions and People's Own Strategies*. Ph. D thesis, School of Development Studies, University of East Anglia, UK.
- Araki M. (2001) "Outside Development Interventions: People's Daily Actions Among The Plateau Tonga Of Zambia." *African Study Monographs* 22(4): 195-208.
- Bangwe L. (1997) *Agricultural Change under Structural Adjustment and Other Shocks in Monze District, Zambia*. Bath: Centre for Development Studies.
- Bernstein H. (2004) "Rural Land and Land Conflicts in Sub-Saharan Africa." In Moyo, S., and P. Yero (ed.): *Reclaiming the Land: The Resurgence of Rural Movements in Africa, Asia and Latin America*. London: Zed Books, forthcoming.
- Berry R. A., and W. R. Cline (1979) *Agrarian Structure and Productivity in Developing Countries*. Baltimore: Johns Hopkins University Press.
- Berry S. (1993) *No Condition is Permanent: The Social Dynamics of Agrarian Change in Sub-Saharan Africa*. Madison, Wisc.: University of Wisconsin Press.
- Binswanger H. P., K. Deininger, and G. Feder (1993) *Power, Distortions, Revolt, and Reform in Agricultural Land Relations* (Policy Research Working Paper No. 1164). Washington, DC: World Bank.
- Biz/ed (2002) *Virtual Zambia*. Bristol: Institute for Learning and Research Technology, University of Bristol.
- Blarel B. (1994) "Tenure Security and Agricultural Production under Land Scarcity: The Case of Rwanda." In Bruce, J. W., and S. Migot-Adholla (ed.): *Searching for Land Tenure Security in Africa*. Washington: World Bank, pp. 71-96.
- Brasselle A.-S., F. Gaspart, and J.-P. Platteau (2002) "Land tenure security and investment incentives: puzzling evidence from Burkina Faso." *Journal of Development Economics* 67:373-418.

- Bruce J. W. (1988) "A Perspective on Indigenous Land Tenure Systems and Land Concentration." In Downs, R. E., and S.P. Reyna (ed.): *Land and Society in Contemporary Africa*. Hanover, NH: University Press of New England.
- Bruce J. W. (2000) "African tenure models at the turn of the century: individual property models and common property models." *Land Reform* 2000/2001:16-27.
- Bruce J. W., and P. P. Dorner (1982) *Agricultural Land Tenure in Zambia: Perspectives, Problems and Opportunities*. Madison, Wisconsin: Land Tenure Center.
- Bruce J. W., and S. Migot-Adholla, eds. (1994) *Searching for Land Tenure Security in Africa*. Washington: The World Bank.
- Bruce J. W., F. Kachamba, and M. Hansungule (1995) "Land Administration: Processes and Constraints." In Roth, M., and S.G. Smith (ed.): *Land Tenure, Land Markets, and Institutional Transformation in Zambia (LTC Research Paper 124)*. Madison: Land Tenure Center.
- Bruce J. W., S. Migot-Adholla, and J. Atherton (1994) "The Findings and their Policy Implications: Institutional Adaptation or Replacement." In Bruce, J. W., and S. Migot-Adholla (ed.): *Searching for Land Tenure Security in Africa*. Washington: World Bank.
- Carter M. R., K. D. Wiebe, and B. Blarel (1994) "Tenure Security for Whom? Differential Effects of Land Policy in Kenya." In Bruce, J.W., and S. Migot-Adholla (ed.): *Searching for Land Tenure Security in Africa*. Washington: World Bank, pp. 141-168.
- Chanock M. (1991) "Paradigms, policies and property: a review of the customary law of land tenure." In Mann, K. and R. Roberts (ed.): *Law in Colonial Africa*. London: James Currey.
- Chenoweth F., J. Knowles, and G. Ngenda (1995) "Settlement Programs." In Roth, M., and S. G. Smith (ed.): *Land Tenure, Land Markets, and Institutional Transformation in Zambia (LTC Research Paper 124)*. Madison: Land Tenure Center, pp. 173-198.
- Chipungu S. N. (1988) *The State, Technology, and Peasant Differentiation in Zambia: a Case Study of the Southern Province, 1930-1986*. Lusaka: Historical Association of Zambia.
- Chiputa H. M. (1985) *Family Farms Limited Settlement Program: Handover Report*. Magoye, Zambia: Family Farms Ltd.
- Cliggett L. (2000) "Social Components of Migration: Experiences from Southern Province, Zambia." *Human Organization* 59:125-135.
- Cochrane J. A., and M. J. Roth (1995) "Land Use Patterns and Growth in Commercial Input Use, Productivity, and Profitability by Farm Size Category." In Roth, M., and S. G. Smith (ed.): *Land Tenure, Land Markets, and Institutional Transformation in Zambia (LTC Research Paper 124)*. Madison: Land Tenure Center, pp. 199-226.
- Colson E. (1958) *Marriage and the Family among the Plateau Tonga of Northern Rhodesia*. Manchester: Manchester University Press.
- Colson E. (1962) *The Plateau Tonga of Northern Rhodesia: Social and Religious Studies*. Manchester, UK: University Press.
- Colson E. (1963) "Lands Rights and Land Use Among the Valley Tonga: the Background to the Kariba Resettlement Programme." In Biebuyck, D. (ed.): *African Agrarian Systems*. London: Oxford University Press, pp. 137-156.

- Copestake J. G. (1997a) *Business development, social security or patronage? Zambia's Agricultural Credit Management Programme*. Bath: University of Bath Centre for Development Studies.
- Copestake J. G. (1997b) *Encouraging sustainable smallholder agriculture in Zambia*. Bath: Centre for Development Studies, University of Bath.
- Cornia G. A. (1985) "Farm Size, Land Yields and the Agricultural Production Function: an Analysis for Fifteen Developing Countries." *World Development* 13:513-534.
- Cousins B. (2000) "Tenure and Common Property Resources in Africa." In Toulmin, C., and J. Quan (ed.): *Evolving Land Rights, Policy and Tenure in Africa*. London: DFID / IIED / NRI.
- Deininger, K. (1999) "Making negotiated land reform work: initial experience from Colombia, Brazil and South Africa." *World Development* 27(4): 651-672.
- Deininger K., and J. May (1999) *Is there scope for growth with equity? The case of land reform in South Africa*. Washington: World Bank, pp. 36.
- Deininger K., and P. Olinto (2000) *Why Liberalization Alone Has Not Improved Agricultural Productivity in Zambia: The Role of Asset Ownership and Working Capital Constraints*. Washington, DC: World Bank.
- Deininger K., R. van den Brink, H. Hoogeveen, and S. Moyo (2000) *How Land Reform can Contribute to Economic Growth and Poverty Reduction: Empirical evidence from international and Zimbabwean experience*. Washington: World Bank.
- Deininger K., S. J. Jin, B. Adenew, S. Gebre-Selassie, and B. Nega (2003) *Tenure Security and Land-Related Investment: Evidence from Ethiopia*. First International Conference on the Ethiopian Economy, 3-5 January 2003.
- Delville P. L. (2000) "Harmonising Formal Law and Customary Land Rights in French-Speaking West Africa." In Toulmin, C., and J. Quan (ed.): *Evolving Land Rights, Policy and Tenure in Africa*. London: DFID / IIED / NRI.
- Department for International Development (DFID) (1999) *Land Rights and Sustainable Development in sub-Saharan Africa: Lessons and Ways Forward in Land Tenure Policy*. Delegate Workshop on Land Tenure Policy in African Nations. London: Department for International Development.
- Drinkwater M. (1994) "Developing Interaction and Understanding: RRA and Farmer Research Groups in Zambia." In Scoones, I. and J. Thompson (eds.): *Beyond Farmer First: Rural People's Knowledge, Agricultural Research and Extension Practice*. London: Intermediate Technology Publications Ltd., pp. 133-139.
- Due J. M., T. Mudenda, and P. Miller (1983) "How Do Rural Women Perceive Development? A Case Study in Zambia." (Illinois Agricultural Economics Staff Paper). Springfield, Illinois: Department of Agricultural Economics, University of Illinois.
- Dyer G. (2004) "Redistributive Land Reform: No April Rose." *Journal of Agrarian Change* 4:45-72.
- El-Ghonemy M. R. (1990) *The Political Economy of Rural Poverty: the Case for Land Reform*. London: Routledge.
- El-Ghonemy M. R. (1999) *The Political Economy of Market-Based Land Reform*. Geneva: United Nations Research Institute for Social Development.
- Feder G., and R. Noronha (1987) "Land Rights Systems and Agricultural Development in sub-Saharan Africa." *The World Bank Research Observer* 2:143-169.

- Feder G., T. Onchan, Y. Chalamwong, and C. Hongladarom (1988) *Land Policies and Farm Productivity in Thailand*. Baltimore: The Johns Hopkins University Press.
- Firmin-Sellers K., and P. Sellers (1999) "Expected Failures and Unexpected Successes of Land Titling in Africa." *World Development* 27:1115-1128.
- Fischer F. U. (1994) *Family Farms Ltd. Annual Report 1993*. Magoye, Zambia: Family Farms Ltd. Conservation Department.
- Food Security Research Project (2000) *Zambia Post-Harvest Survey (1999/2000) for Small and Medium-Sized Holdings (Synthetic Questionnaire)*. Lusaka: Food Security Research Project.
- Francis P. A., J. T. Milimo, C. A. Njobvu, and S. P. M. Tembo (1997) *Listening to Farmers: Participatory Assessment of Policy Reform in Zambia's Agricultural Sector*. Washington: World Bank.
- GART (Golden Valley Agricultural Research Trust (2000) *2000 Year Book (Vol. 2, No. 1)*. Lusaka: Golden Valley Agricultural Research Trust.
- Geisler G. (1992) "Who is Losing Out? Structural Adjustment, Gender, and the Agricultural Sector in Zambia." *Journal of Modern African Studies* 30:113-139.
- Gittinger J. P. (1982) *Economic Analysis of Agricultural Projects*. Baltimore: Johns Hopkins University Press, 1982.
- Golan E. H. (1994) "Land Tenure Reform in the Peanut Basin of Senegal." In Bruce, J. W., and S. Migot-Adholla (ed.): *Searching for Land Tenure Security in Africa*. Washington: World Bank.
- Gray L. C., and M. Kevane (1999) Diminished Access, Diverted Exclusion: Women and Land Tenure in Sub-Saharan Africa. *African Studies Review* 42: 15-39.
- Griffin K., A. R. Khan, and A. Ickowitz (2002) "Poverty and Distribution of Land." *Journal of Agrarian Change* 2:279-330.
- Hansungule M., P. Feeney, and R. Palmer (1998) *Report on Land Tenure Insecurity on the Zambian Copperbelt*. Oxford: OXFAM.
- Hardin G. (1968) "The Tragedy of the Commons." *Science* 261:1243-1248.
- Hilhorst T. (2000) "Women's Land Rights: Current Developments in Sub-Saharan Africa". In Toulmin, C., and Julian Quan (ed.): *Evolving Land Rights, Policy and Tenure in Africa*. London: DFID / IIED / NRI.
- Hunt D. (2001) *Tenurial Change in Sub-Saharan Africa: the titling debate revisited*. (Unpublished monograph.) Brighton, UK: School of African and Asian Studies, Sussex University.
- Jacobs S. (2000) "Zimbabwe: Why Land Reform is a Gender Issue." *Sociological Research Online* 5.
- Kajoba G. H. (1998) *The Landmarks of Zambia's Land Tenure System: from Protectionism to Empowerment*. International Conference on Land Tenure in the Developing World with a Focus on Southern Africa.
- Kevane M., and L. C. Gray (1999) "A Woman's Field is Made at Night: Gendered Land Rights and Norms in Burkina Faso." *Feminist Economics* 5:1-26.
- Kindness L. (1996) *Witchcraft and the Reproduction of Wealth in Southern Zambia*. Ph.D. dissertation, London School of Economics and Political Science, London.

- Kumar S. K. (1994) *Adoption of Hybrid Maize in Zambia: Effects on Gender Roles, Food Consumption, and Nutrition. (Research Report 100)* Washington, D.C.: International Food Policy Research Institute.
- Kuznets S. (1955) "Economic Growth and Income Inequality." *American Economic Review* 45(1): 1-28.
- Kydd J. (1989) "Zambia in the 1980s: The Political Economy of Adjustment." In Commander, S. (ed.): *Structural Adjustment & Agriculture: Theory & Practice in Africa & Latin America*. London: Overseas Development Institute, pp. 127-144.
- Lahiff E. (2001) *Land Reform in South Africa: Is It Meeting the Challenge?* (PLAAS Policy Brief No. 1) Cape Town: Programme for Land and Agrarian Studies, University of the Western Cape.
- Machina H. (2002) *Women's Land Rights in Zambia: Policy Provisions, Legal Framework and Constraints*. Regional Conference on Women's Land Rights.
- Manji A. (2003) "Capital, labour and land relations in Africa: a Gender Analysis of the World Bank's Policy Research Report on Land Institutions and Land Policy." *Third World Quarterly* 24: 97-114.
- Matlon P. (1994) "Indigenous Land Use Systems and Investments in Soil Fertility in Burkina Faso." In Bruce, J. W., and S. Migot-Adholla (ed.): *Searching for Land Tenure Security in Africa*. Washington: The World Bank.
- Mbulo M. P. (1983) *The Management and Performance of Settlement Schemes in Southern Province, Zambia*. York: Centre for Southern African Studies, University of York.
- McAuslan P. (2000) "Only the Name of the Country Changes: The Diaspora of 'European' Land Law in Commonwealth Africa." In Toulmin, C., and J. Quan (ed.): *Evolving Land Rights, Policy and Tenure in Africa*. London: DFID / IIED / NRI.
- Megill D. J. (2000) *Review Of Sample Design For Zambia Post-Harvest Survey (1997/98) And Recommendations For Improving The Sampling Strategy And Estimation Procedures*. Lusaka: Food Security Research Project.
- Migot-Adholla S. E., F. Place, and W. Oluoch-Kosura (1994) "Security of Tenure and Land Productivity in Kenya." In Bruce, J. W., and S. Migot-Adholla (ed.): *Searching for Land Tenure Security in Africa*. Washington: World Bank.
- Momba J. C. (1989) "The State, Rural Class Formation and Peasant Political Participation in Zambia: the Case of Southern Province." *African Affairs* 88:331-357.
- Moore H. L., and M. Vaughan (1994) *Cutting Down Trees: Gender, Nutrition, and Agricultural Change in the Northern Province of Zambia, 1890-1990*. Portsmouth, NH: Heinemann.
- Moyo S. (1995) *The Land Question in Zimbabwe*. Harare: SAPES Trust.
- Mupenda W. C., P. Jabani, and H. Mtonga (1983) *Agricultural Settlement Schemes in Zambia*. Lusaka: Land Use Branch, Department of Agriculture.
- Mvunga M. P. (1982) *Land Law and Policy in Zambia*. Lusaka: Institute for African Studies.
- Nelson-Richards M. (1988) *Beyond the Sociology of Agrarian Transformation: Economy and Society in Zambia, Nepal and Zanzibar*. Leiden: E.J. Brill.
- Okoth-Ogendo H. W. O. (2000) "Legislative Approaches to Customary Tenure and Tenure Reform in East Africa." In Toulmin, C., and J. Quan (ed.): *Evolving Land Rights, Policy and Tenure in Africa*. London: DFID / IIED / NRI.

- Ostrom E. (1990) *Governing the Commons. The evolution of institutions for collective action*. Cambridge: Cambridge University Press.
- Ovonji-Odida I. (1999) *Land Law Reform: Challenges and Opportunities for Securing Women's Land Rights in Uganda*. Paper presented at the DFID Workshop on Land Rights and Sustainable Development in sub-Saharan Africa: Lessons and Ways Forward in Land Tenure Policy, Sunningdale, UK, 16-19 February.
- Oxfam-GB (1999) *CLIP Agricultural Baseline Survey, 1999*. Lusaka: Oxfam-GB.
- Peters P. (1999) "The Limits of Negotiability: Security, Equity and Class Formation in Africa's Land Systems." [Revised May 2000.] Roskilde Conference on Negotiating Property, 16-17 October 1999.
- Peters P. (2002) "Bewitching Land: the Role of Land Disputes in Converting Kin to Strangers and in Class Formation in Malawi." *Journal of Southern African Studies* 28:155-178.
- Peters P. (2004) "Inequality and Social Conflict over Land in Africa." *Journal of Agrarian Change* 4(3): 269-314.
- Place F., V. R. N. Chinene, M. Hansungule, and F. Maimbo (1995) "Land Tenure and Agricultural Development in Customary Areas: Results from Eastern and Southern Provinces." In Roth, M., and S. G. Smith (ed.): *Land Tenure, Land Markets, and Institutional Transformation in Zambia*. Madison, Wisc. USA: University of Wisconsin Land Tenure Center.
- Place F., and K. Otsuka (2002) "Land Tenure Systems and Their Impacts on Agricultural Investments and Productivity in Uganda." *Journal of Development Studies* 38:105-128.
- Platteau J.-P. (1992) *Formalization and Privatization of Land Rights in Sub-Saharan Africa: A Critique of Current Orthodoxies and Structural Adjustment Programmes*. (DEP No. 34). London: Suntory-Toyota International Centre for Economics and Related Disciplines (London School of Economics).
- Platteau J.-P. (1996) "The Evolutionary Theory of Land Rights as Applied to sub-Saharan Africa: a Critical Assessment." *Development and Change* 27:29-86.
- Platteau J.-P. (2000) "Does Africa Need Land Reform?" In Toulmin, C., and J. Quan (ed.): *Evolving Land Rights, Policy and Tenure in Africa*. London: DFID / IIED / NRI, pp. 51-74.
- Poate C. D., and P. F. Daplyn (1993) *Data for Agrarian Development*. Cambridge UK: Cambridge University Press.
- Quan J. (1997) *The Importance of Land Tenure to Poverty Eradication and Sustainable Development in Africa: Summary of Findings*. Chatham, UK: Natural Resources Institute.
- Quan J. (2000) "Land Tenure, Economic Growth and Poverty in Sub-Saharan Africa." In Toulmin, C., and J. Quan (ed.): *Evolving Land Rights, Policy and Tenure in Africa*. London: DFID / IIED / NRI.
- Richards A. (1939) *Land, Labour and Diet in Northern Rhodesia: an Economic Study of the Bemba Tribe*. Muenster-Hamburg: LIT Verlag.
- Roth M., A. M. Khan, and M. C. Zulu (1995) "Legal Framework and Administration of Land Policy in Zambia." In Roth, M., and S.G. Smith (ed.): *Land Tenure, Land Markets, and Institutional Transformation in Zambia (LTC Research Paper 124)*. Madison: Land Tenure Center.

- Sender J. (2002) "Women's Struggle to Escape Rural Poverty in South Africa." *Journal of Agrarian Change* 2:1-49.
- Sender J., and D. Johnston (1995) *A Fuzzy Snapshot of Some Poor and Invisible Women: Farm Labourers in South Africa (Department of Economic Working Paper Series No. 56)*. London: School of Oriental and African Studies, University of London.
- Sender J., and D. Johnston (2004) "Searching for Weapons of Mass Production in Rural Africa: Unconvincing Arguments for Land Reform." *Journal of Agrarian Change* 4:142-164.
- Shipton P., and M. Goheen (1992) "Understanding African Land-Holding: Power, Wealth, and Meaning." *Africa* 62:307-325.
- Sjaastad E. (1998) *Land Tenure and Land Use in Zambia: Cases from the Northern and Southern Provinces*. Ph.D. dissertation, Agricultural University of Norway, As.
- Sjaastad E., and D. W. Bromley (2000) "The Prejudices of Property Rights: On Individualism, Specificity, and Security in Property Regimes." *Development Policy Review* 18:365-389.
- Sunde J. (1997) *Who Benefits? The Gendered Transfer of Development Benefits within the Southern Cape Land Reform Pilot Scheme*. Stellenbosch: Centre for Rural Legal Studies.
- Tadesse Z. (2003) "Women and Land Rights in the Third World: The Case of Ethiopia". In Muthoni Wanyeki, L. (ed.): *Women and Land in Africa: Culture, Religion and Realizing Women's Rights*. London and New York: Zed Books, Ltd., pp. 67-95.
- Toulmin C. (2000) "Decentralisation and Land Tenure." In Toulmin, C., and J. Quan (ed.): *Evolving Land Rights, Policy and Tenure in Africa*. London: Department for International Development / International Institute for Environment and Development / Natural Resources Institute.
- Toulmin C., and J. Quan (2000a) "Evolving Land Rights, Tenure and Policy in Sub-Saharan Africa." In Toulmin, C., and J. Quan (ed.): *Evolving Land Rights, Policy and Tenure in Africa*. London: DFID / IIED / NRI.
- Toulmin C., and J. Quan (2000b) "Registering Customary Rights." In Toulmin, C., and J. Quan (ed.): *Evolving Land Rights, Policy and Tenure in Africa*. London: DFID / IIED / NRI.
- van den Brink R. (2003) *Land Policy and Land Reform in Sub-Saharan Africa: Consensus, Confusion and Controversy*. Washington: World Bank.
- Verdery K. (1998) "Property and Power in Transylvania's Decollectivization." In Hann, C. M. (ed.): *Property Relations*. Cambridge: Cambridge University Press, pp. 160-180.
- Vickery K. (1976) "Aspects of Plateau Tonga Economic History." In Palmer, R. (ed.): *Zambian Land and Labour Studies, Vol. III*. Lusaka: National Archives of Zambia, pp. 55-67.
- Waller K. (1997) *The Impact of HIV/AIDS on Farming Households in the Monze District of Zambia*. Bath: University of Bath Centre for Development Studies.
- White C. M. N. (1963) "Factors Determining the Content of African Land-Tenure Systems in Northern Rhodesia." In Biebuyck, D. (ed.): *African Agrarian Systems*. London: Oxford University Press, pp. 364-373.
- Woodhouse P., H. Bernstein, and D. Hulme, eds. (2001) *African Enclosures? The Social Dynamics of Wetlands in Drylands*. Oxford: James Currey Ltd.

- World Bank (1996) *Zambia agricultural sector investment programme, Staff Appraisal Report*. Washington: Southern Africa Dept., Agriculture and Environment Division, World Bank.
- World Bank (2001) *Zambia at a Glance*. Washington: World Bank.
- World Health Organisation (2001) *Global Water Supply and Sanitation Assessment 2000 Report*. Geneva: World Health Organization.
- Zambia Government of the Republic of (1985) *A Report of the Commission of Inquiry into Land Matters in the Southern Province*. Lusaka: Government Printing Office.
- Zambia Government of the Republic of (1989) *Zambia Intestate Succession Act*. Lusaka: Government Printing Office.
- Zambia Government of the Republic of (1995a) *1990 Census of Population, Housing and Agriculture*. Lusaka: Central Statistical Office.
- Zambia Government of the Republic of (1995b) *Lands Act, 1995*. Lusaka: Government Printing Office.
- Zambia Government of the Republic of (2000) *"Agricultural and Pastoral Production (Small And Medium Scale Holdings) 1997-98: Structural Type and Post-Harvest Data (Executive Summary Only)"*. Lusaka: Central Statistics Office.
- Zambia Government of the Republic of (2001) *Supplemental Survey to the 1999/2000 Post Harvest Survey (for small and medium scale holdings)*. Lusaka: Central Statistical Office.
- Zambia Government of the Republic of (2001) *Supplementary Survey to the 1999/2000 PHS: Interviewers Instruction Manual*. Lusaka: Central Statistical Office.
- Zambia, Government of the Republic of (2002). *Draft Land Tenure Policy*. Lusaka: Zambia Daily Mail (21 November 2002).
- Zulu B., J. J. Nijhoff, T. S. Jayne, and A. Negassa (2000) *Is the Glass Half-Empty or Half Full? An Analysis of Agricultural Production Trends in Zambia*. Lusaka: Food Security Research Project.

Annex 1: DETAILS ON CALCULATIONS OF DERIVED VARIABLES

A-1.1: Derivation of typical costs of types of fixed investment

As described, the process used to derive a typical cost for each type of investment is basically simple: convert all reported costs to constant terms using a GNP deflator, eliminate implausible extreme values, and select the central value (mean, median, or mode) that best reflected the remaining reports.

The sets of reported costs for each type of installation contain large, somewhat alarming ranges of variation. Why the wide discrepancies? There are likely to be two main factors: design or quality of the installation, and respondent error or subjectivity combined with inflation rates. Taking wells as an example, a simple unimproved (unlined) well of a few meters deep, good enough for year-round groundwater in some locations, can be had for the cost of several days' labour. Other farms might require a more expensive well: deeper, if the groundwater is deeper in that locale, and/or concrete-lined, if the soil is unstable or the owner prefers a more durable installation. It is therefore plausible that costs (in constant terms) vary from a few days' wages to several hundred or even thousand dollars. The other factor, respondent error or subjectivity, interacts with inflation rates (used in this analysis to render reported costs into constant terms). Zambia has had double- or triple-digit inflation for each of at least the past 15 years. Asked about the cost of an item paid for ten years ago, a respondent may answer in nominal terms (what she actually paid 10 years ago), or may subjectively render the response in current terms (the perceived equivalent in current kwacha). The enumerators did not ask respondents to specify whether they were responding in nominal or current terms; therefore, for this analysis, we have assumed that all responses were in nominal terms, to be converted to constant terms by applying the consumer price index. However in those cases where this assumption is wrong and the respondents were trying (helpfully enough) to render the original cost in current terms, the result would be a greatly inflated cost in constant terms. This is the likely explanation of the extremely high values of some of the reported costs when converted to constant terms. (And indeed, examination of the data will show that most of the extreme values referred to expenditures 10 or more years ago.) So, in the effort to derive a typical cost of each type of investment to assign to cases where respondents could not recall the actual cost, it makes sense to eliminate all extreme values. Where the cut-off point for elimination should be is a somewhat subjective judgement; but here, we apply a

common-sense appraisal, based on familiarity with the cost of things in that part of Zambia, to what an acceptably plausible outlying value should be.

This method does not account for the possibility of changes in the real prices of materials over the years; for example, cement may have cost significantly more in the 1990s than in the 1980s. Similarly, relative prices (e.g. cement *vs.* fencing wire) may have shifted significantly over the whole period (1975-2001) for which fixed investments were recorded. No suitable relative price series for this period could be identified. A heroic assumption is therefore made, that any such changes are insignificant and can remain unaccounted in the derived typical costs.

The question remains of what to do with the extreme values eliminated in this process of deriving a typical cost. Since the relevant respondents reported those costs specifically, if they are plausible they should go into their final 'scores' of aggregate value of fixed investments. Implausible figures, as discussed above, are likely to be the result of the inflation calculation, poor recall, or perhaps respondent exaggeration. Implausible figures should not be reduced to zero, however, if the fixed investment was indeed installed and paid for. The decision is therefore to substitute the typical cost for any implausibly high figure.

Although this procedure contains safeguards against adoption of implausible high values, a further safeguard can be applied at the stage of analysis when the costs of each case's various fixed investments are aggregated. The aggregate scores can be analysed again for extremes and outliers, and some may be excluded as necessary.

Following are the details for each investment type.

A-1.1.1 WELLS

We start by examining the frequency table (Table 7.2) and descriptive statistics (Table 7.3) of all 43 cases where well owners reported the cost, to show how the varying reports are reduced to a typical cost. (Costs have been converted into constant 1995 kwacha.)

Table 7.2: Reported Costs of Wells (converted into constant 1995 kwacha)

Reported Cost (constant Kw)	Frequency		Reported Cost (constant Kw)	Frequency
0	4		140,620	1
10,321	1		150,000	1
15,000	1		172,414	1
15,481	1		250,000	1
17,201	1		285,714	1
23,245	1		387,027	1
23,531	1		410,200	1
30,921	1		500,000	2
33,568	1		764,895	1
35,714	1		798,722	1
51,077	1		1,277,955	1
67,085	1		1,900,000	1
100,000	2		2,500,000	1
103,207	1		3,965,270	1
106,410	1		50,000,000	1
129,009	2		100,000,000	1
133,333	1		250,000,000	1
136,733	2		275,862,069	1
			Total	43

Table 7.3: Descriptive statistics of reported well costs

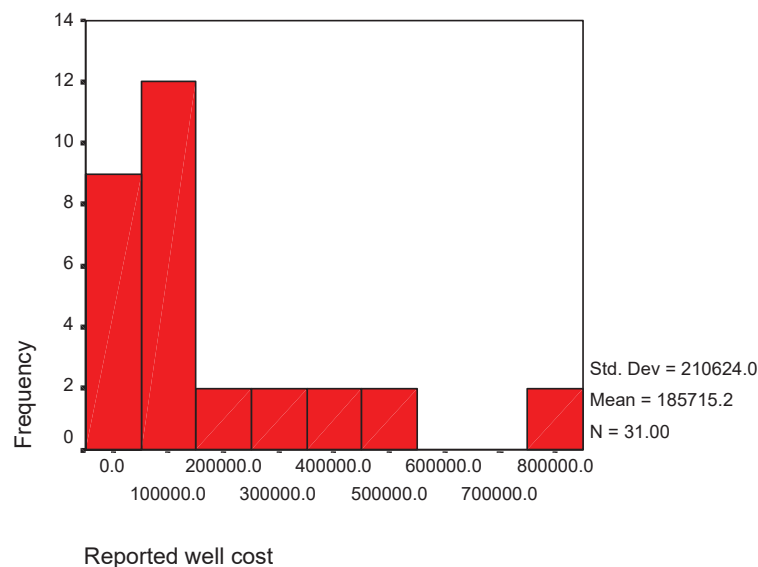
	Statistic	Std. Error
Mean	16,075,871.31	8805038.93
5% Trimmed Mean	3,886,315.18	
Median	133,333.33	

Mean unit cost (in constant Kw terms) of all reported cases is Kw 16,075,871 (about USD \$18,700 at contemporary exchange rate¹⁵²). Median cost is Kw 133,333 (\$154).

We next eliminate extreme values. Excluding the 4 cases where reported cost was zero (due to it being a gift or to the current owner having found the well already on the land at acquisition) and the four cases of highest reported cost (the highest being Kw 275,862,069 or \$319,197), the mean becomes Kw 440,011 (\$509) and the median remains Kw 133,333. The new highest case following this exclusion is Kw 3,965,270 (\$4,589), which is somewhat plausible as a highest case in the sense that it is within the range of what a relatively deep, improved (concrete-lined) wide-bore well would cost, although it is certainly more than the average small farm family could or would spend on a well.

Despite the arguable plausibility of the remaining highest value, we continue with another round of eliminations, to test the sensitivity of the mean and median to further trimming of outlying values. We now eliminate the four highest values (from Kw 3,965,270 to Kw 1,277,955), which leaves Kw 798,722 (\$924) as the highest value, well within the range of plausibility for an expensive well. The remaining sample post-eliminations is charted in Figure 7.1:

Figure 7.1 Histogram of reported well costs after second eliminations



¹⁵² The constant kwacha terms were used throughout the analysis, but dollar equivalents are given here to allow the reader to make a common-sense appraisal of the average cost figures. As the 'constant kwacha' are based on the CPI series in which 1995 = 100, the dollar equivalents are at the 1995 average daily exchange rate of US\$1 = Kw 864.26 [Governors, 1999 #151].

This histogram shows that, after the second round of eliminations, a clearer central tendency has emerged. The majority of remaining values are grouped between the lowest case (Kw 10,321 or \$12) and Kw 150,000. The mean becomes Kw 185,715 (\$215), as compared to Kw 440,011 (\$509) before the latest eliminations. The median becomes Kw 129,009 (\$149), not so different from the previous Kw 133,333 (\$154). True to the mathematics, the influence of outliers is heavy on the means and lighter on the medians; so the median is a better choice as a representative value that can be assigned to cases where costs were not reported.

Because we are testing the null hypothesis, that land tenure security has no effect on accumulated value of land improvements, we wish to use conservatively low estimates of the accumulated values. We therefore accept the calculation after the second elimination of extremes, which gives us *a median cost of wells (in constant terms) of Kw 129,009 (\$149)*. For the purposes of analysis, this figure will be assigned to cases where respondents were unable to report the cost of their well.

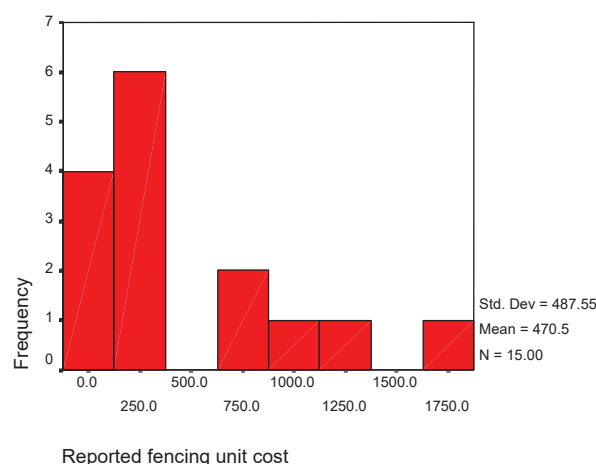
A one-sample *t*-test for the trimmed data on which this median is based is significant ($t = 4.909$, $df = 30$, $p < 0.01$). The 95% confidence interval of the difference ranges from Kw 108,458 to Kw 262,973.

A-1.1.2 FENCING

The 21 cases of (non-zero) reported fencing costs have a mean of Kw 197,613¹⁵³ and a median of Kw 851.28; they range from Kw 43 (\$0.05) to a clearly implausible Kw 2,180,074 (\$2,522.47). As with wells, each of the six extreme highest reported values are for fencing installed more than ten years before the study (1975-1989 in these cases). Therefore they are probably the result of respondents' implicit conversion of the cost into current terms when reporting, and can safely be excluded. The lowest extreme on the other hand (Kw 43 or US\$0.04) is arguably within the bounds of plausibility, if it refers for instance to second-hand wire being purchased, or the use of thorn bushes and labour instead of wire. So the six highest reports are excluded, while the low ones remain. The remaining reports have a mean of Kw 450.73 and median of Kw 214.97, and yield the following histogram (Figure 7.2):

¹⁵³ Constant kwacha, per meter.

Figure 7.2: Histogram of reported fencing costs after eliminating extremes



Now a central tendency takes shape. The remaining highest report (Kw 1,643, or USD 1.90) cannot be arbitrarily excluded, as it is plausible for a higher quality of fence (several horizontal strands, better-quality or more tightly-spaced posts). Also, that case refers to a relatively recent installation (1997), and so is not very vulnerable to the interaction of respondent recall and inflation. Anyway, eliminating it would affect the mean, but would little affect the median, which (as it again approximates the mode) is our statistic of choice for a value to impute to cases where no data on value were collected. Therefore we accept the median of this dataset (Kw 214.97, or USD 0.25) as the typical per-meter value of fencing to be assigned to cases with missing costs.

A-1.1.3 PLANTED TREES (WINDBREAK)

Here there is a different kind of valuation problem: free provision of tree seedlings from aid agencies to farmers has been rife in the study area, in an effort to retard soil degradation.¹⁵⁴ 57 out of 266 respondent households (21%) reported planting some windbreak trees, in quantities ranging from 1 to 304 (mean 23, median 5, mode 1). There were 13 cases with reported costs, of which all but 3 are zero (because the trees were reported as a gift). The three non-zero values per tree are: Kw 13,793 (\$15.96), Kw 638 (\$0.78), and Kw 34 (\$0.04). These widely-dispersed values will not yield a central value. Therefore, windbreak trees will be assigned no cost (though they will be counted with points, as described in the next section).

¹⁵⁴ By Family Farms among others, as reported in Fischer (1994).

A-1.1.4 PLANTED TREES (CROPS)

There were 169 occurrences of crop-tree planting. The problem of free provision encountered with windbreak trees is less severe with crop trees. 16 (70%) out of 23 respondents who specified the source of funds for their acquisition of crop tree seedlings paid for them from their farm income; 6 of the remaining 7 (26%) received them as gifts, and the last one found the crop trees when s/he acquired the land.

There are 28 cases where costs were reported, including 11 cases (39%) where the reported cost was zero (due to being a gift or other reason, such as perhaps being grown from respondent's own seed). The three highest values are all from expenditures of more than 8 years ago, and therefore can be safely excluded. One might be tempted to exclude the zero values, but since there are indications that at least 26% of all respondents who planted crop trees received them for free, the zero values should be maintained in the calculation of averages to account for this probability. (Many respondents offered no answer when asked how the improvement was paid for, so we assume that a proportion of cases of crop trees without reported means of payment were gifts, in similar proportion to the reported cases.)

So, excluding the three high extremes (but retaining the zero-cost reports) yields the following figures from the remaining reports. Mean is Kw 368.79 (\$0.43), median is 81.48 (\$0.09). Range is from zero to Kw 2,983 (a plausible \$3.45). The mean is heavily influenced by high outliers (it is above the 72nd percentile). Conservatively, we therefore accept the median figure of Kw 81.48 to assign to cases without cost reports.

A-1.1.5 DAMS

There were 14 cases of dams among respondents, of which 8 came with reported costs, and one was a gift from an aid agency. (Another was also a gift, but the respondent knew the cost, and so the figure can be used to estimate an average cost, though it will not be attributed to the respondent as a fixed investment.) The imputation exercise therefore applies to finding a proper cost to attribute to the remaining five. The exercise is important because dams are obviously a major investment which would not be sensible in a situation of insecure tenure. Unfortunately, in this case the reported costs are not very helpful in finding a plausible mean, because of the small sub-sample and the relatively high cost of dams. Such high cost means that the usual amplification effect of mis-reporting with respect to inflation is even more severe. Table 7.4 shows the frequencies of reported costs in constant terms (in nominal and constant kwacha, and dollar equivalents):

Table 7.4: Reported costs of dams, nominal and constant kwacha

Year	CPI Deflator (1995=100)	Nominal cost (Kw)	Constant cost (Kw)	Unit cost constant (Kw)	Source of finance	Unit cost constant (\$)
1987	0.42	240,000	57,142,857	28,571,429	income from farm	33,069
2000	387.57	47,000,000	12,126,842	12,126,842	gift	14,036
1982	0.10	100,000	100,000,000	100,000,000	.	115,741
1994	74.52	-	-	-	gift	-
2000	387.57	10,000,000	2,580,179	2,580,179	income from farm	2,986
1991	6.26	2,000,000	31,948,882	31,948,882	income from farm	36,978
1984	0.14	20,000	14,285,714	7,142,857	income from farm	8,267
1987	0.42	8,000,000	1,904,761,905	952,380,952	income from farm	1,102,293
1980	0.08	4,500,000	5,625,000,000	2,812,500,000	unknown	3,255,208

Again, the implausible extremes are generally the oldest cases. After eliminating the extremes (in this case the five highest values), we are left with only three observations: \$14,036, \$8,267, and \$2,986. The highest of these three relates to an expenditure in 2000, and so may be thought relatively reliable; however we also note that this is the gift dam, whose cost the respondent claimed to know, a report of somewhat less reliability than would be the case if the respondent had paid her/himself. The middle observation is from 1984, and although the figure is plausible, the conversion to constant terms is vulnerable to recall/inflation distortion. The lowest observation is also from year 2000, and the respondent paid her/himself.

We face the choice of taking the median, the mean, or a single observation. One observation, as noted above, clearly has more reliability than the other two, meaning that either the median or the mean would be influenced by possibly unreliable cases. The author, as it happens, has experience in designing and budgeting small dams in the study region, and finds the low figure (\$2,986 or constant Kw 2,580,179) to be plausible and conservative. Therefore we accept this figure for assignment to the five dam cases with no report of costs (and also for the cases from the above sub-sample where inflation has rendered the reported costs clearly implausible).

A-1.1.6 BOREHOLES

As with dams, there is a small number of boreholes in the sample (11), of which 7 reported the costs, so we have to impute cost only for the remaining three cases. However, like dams, boreholes are a major expense, and also extremely valuable to farming in semi-arid zones, so they too are a variable of great interest. We want to be sure to give farmers who install boreholes their due as investors in the land.

The reported costs for the seven boreholes include three implausible extremes (over \$240,000). All are from the period 1984-86 (though other reports from 1983-86 are in fact non-extreme and plausible). When those three are eliminated, the next highest (\$12,421) is plausible.¹⁵⁵ The remaining reports have a mean of \$7,917 and median of \$8,342; the similarity of the two indicate a central tendency.¹⁵⁶ Choosing between the mean and median, we prefer the mean because it is slightly lower, in line with our preference for conservative estimates. We also note that by coincidence, the mean (\$7917) is very close to the reported cost (in constant terms) of the most recent borehole of this sub-sample (1996), and as we have already discussed there is reason to believe that more recent reports are more reliable, due to inflation. \$7917 could represent a borehole of about 100 meters depth costing \$80 per meter; both parameters are in the mid-range of plausible depths and costs. This mean could therefore be accepted as the typical cost.

However, in the special case of boreholes, it is possible to find some corroborating data on costs, because boreholes are a popular item among aid agencies, government departments, and commercial farmers. An aid agency planning boreholes in refugee camps in Western Province budgeted \$6,640 per borehole.¹⁵⁷ A World Health Organisation country-wide borehole drilling project in Zambia (for potable water supply) reported initial unit costs of \$5,000, subsequently reduced to an average of \$2,600 (by means of offering multi-borehole contracts and easing the design specifications to be more appropriate for handpumps).¹⁵⁸ Comparing these with our reported costs, both are lower than our mean. Western Province is a good deal more remote than Southern Province, so unit costs there

¹⁵⁵ As it happens, the author is experienced in budgeting boreholes in the study region. Borehole drilling/construction costs normally vary from US\$40-100 per meter of depth, depending on quality of materials, diameter, speed of construction, remoteness of location, etc. Therefore the remaining highest value of \$12,421 could represent an approximately 120-meter-deep borehole costing \$100 per meter, or a 207-meter-deep hole costing \$60 per meter; all these parameters are plausible in this region.

¹⁵⁶ Again for this discussion we use dollar equivalents, to avoid long strings of digits.

¹⁵⁷ Action by Churches Together, 2002.

¹⁵⁸ World Health Organisation, 2001.

can be expected to be higher; on the other hand, that agency was offering multi-borehole contracts, which would bring unit costs down. The higher WHO figure reflected single-borehole contracts, and implied that the specifications for those boreholes were excessive (greater diameter etc.) and hence more expensive than necessary for low-yield village water points; the second, lower figure reflects these adjustments. We note on the other hand that the WHO figures were a country-wide average, not necessarily reflecting the hydro-geology and costs of drilling in Southern Province specifically. Nonetheless we are cautious about imputing too much value to boreholes with unreported costs, as it might lead to wrongly rejecting the null hypothesis. We bear in mind that the imputed figure will be applied to the three cases that did not report a cost of their boreholes, and also to the three cases with extreme implausible reported costs. Another consideration is that the ACT and WHO figures referred to drilling costs only, whereas a borehole needs pumping equipment; it cannot accommodate a bucket-and-rope as can a wide-diameter shallow well. The respondents' reported figures therefore are likely to implicitly include costs of installed pumping equipment, which can vary from about \$400 for a handpump to \$5000 for electric or diesel pumps. But, pumping and sprinkler equipment can be removed and used elsewhere, and thus are not a fixed investment. On balance then, we are therefore inclined to adopt the first WHO figure (\$5000, or constant Kw 4,321,300) for assignment, to be on the side of caution, and also bearing in mind that a respondent with \$5000 worth of fixed investment will anyway be a high-end outlier in our sample.

A-1.1.7 CONCRETE HOUSES:

For concrete houses, 25 out of 56 occurrences (45%) came with reported costs. Examination of the reporting cases shows that again, all the extreme values are old expenditures (pre-1991):

Table 7.5: Reported costs of concrete houses, nominal and constant kwacha

Year	Nominal cost (Kw)	Constant cost (Kw)	Unit cost constant (Kw)	Source of finance	Unit cost constant (\$)
1985	11,000,000	5,789,473,684	482,456,140	Income from farm	558,230
2000	-	-	-	Gift	-
1994	17,000	22,813	22,813	Informal loan	26
2001	50,000	12,901	6,450	Income from farm	7
1997	472,000	258,545	258,545	Income from farm	299

1990	-	-	-	Found it	-
1985	200,000	105,263,158	52,631,579	income from farm	60,898
1984	360000	257142857	257142857	.	297,530
1999	280000	93991	93991	income from farm	109
1997	90000	49299	49299	income from farm	57
2000	5000000	1290090	1290090	income from farm	1,493
1990	3000000	92592593	92592593	income from farm	107,135
2000	3000000	774054	774054	income from farm	896
1997	330000	180762	180762	income from farm	209
1998	1090000	463948	463948	income from farm	537
1999	5300000	1779121	296520	income from farm	343
1999	470000	157771	157771	income from farm	183
2000	1800000	464432	464432	income from farm	537
1998	2215000	942794	314265	income from farm	364
1990	25000	771605	385802	income from farm	446
2000	1500000	387027	387027	other	448
1999	120000	40282	20141	income from farm	23
1978	2000	3333333	3333333	non-farm income	3,857
1988	25	3846	3846	income from farm	4
1998	900000	383077	383077	.	443

We therefore exclude the five highest values. There are also four low values less than \$30. A sack of cement historically costs about \$8-9 in the study region (based on the author's experience in budgeting construction works). It is hard to imagine building a concrete house with less than four sacks of cement. On the other hand, we note that two of these four reports are recent (1999 and 2001), and so both respondent recall and low inflation distortion argue in favour of their accuracy. The explanation may be in categorisation of a house as "concrete." It is a common method in the study area to plaster mud-brick houses with a cement mortar, to resist weathering. The result may be considered by the respondent to be a "concrete house," though it would obviously cost less than a cinder-block construction. If we are to impute costs to self-reported "concrete houses," we must average in the possibility that some of those houses are actually of the cheaper plastered design. Therefore we exclude the two old low observations, and retain the two more recent. We also exclude the two zero values, as both of those respondents specified that they had not paid for the houses (one a gift, one found on the land at acquisition). After these eliminations, the mean of the remaining reports is \$399.63, and

median is \$353.36, indicating fairly good central tendency. The highest remaining value (\$1,493) is plausible for a large house, so there are no grounds for excluding it. Maintaining our preference for conservative estimates, we choose the median (\$353.36, or constant Kw 305,395) rather than the higher mean as the figure to be assigned.

A-1.1.8 BURNT-BRICK HOUSES:

“Burnt bricks” means mud-clay bricks fired in kilns for greater durability. The resulting house is more durable (and expensive) than those made of unfired bricks, though less so than concrete houses. Burnt bricks are usually purchased locally, though sometimes made by the family’s own labour. In our sample, of 103 occurrences of burnt-brick houses, 55 (53%) came with cost reports. Of those we exclude one that had no year attached (the respondent had been on that parcel since 1951) and so was unusable because of inflation; another was zero because the costs were covered by a gift. We also eliminate an extreme case of \$43,490, because it is implausible and from 1975, thus vulnerable to inflation-recall distortion.

The remaining 52 cases have a mean of \$341.75 and median of \$97.80. Range is from \$4.00 to \$4,123.00. The latter is difficult to exclude arbitrarily, being a plausible cost for an elaborate burnt-brick house (perhaps with a concrete floor and plaster, tin roof, etc.). Also, in determining the median, these high values are offset by the several low values of less than \$10 (also plausible, if the burnt bricks were made mostly with family labour, and if the house is small). Eliminating the remaining high extreme (\$4,123) would change the median significantly, from \$97.80 to \$60, a drop of more than 30%. However, examining the raw frequencies, we see that there are plenty of recent reports (1997 or after) of costs in the range of \$100-300; so we should not make the error of creating a downward bias, conservative though our preferences are. We therefore accept the existing median of \$97.80 (constant Kw 84,525) as the figure to be assigned to the unreported and implausibly- reported cases.

GENERAL NOTE ON COSTS OF FIXED INVESTMENTS: We actually derive two versions of this: one that counts all fixed investments irrespective of date of installation, and a second that excludes costs (reported or assigned) of investments installed before 1975. The second will be used in analysis because, as mentioned above, this enquiry seeks to model farmers’ behaviour as possibly influenced by land tenure status. Historical accumulations of fixed investments must be considered, especially as such investments are unlikely to be made all at once. However, such historical data collection is limited by historical land tenure conditions. It does not make sense to include farmer investments

from Year X in the analysis if we cannot confidently assess the land tenure conditions perceived by the farmer in that year (and the years leading up to the investment decision). Since reports of fixed investments in this sample go back to the 1950s, it seems sensible to set a cut-off date, before which investment decisions will not be counted. 1975 is therefore chosen as the cut-off date, because the 1975 land law (Conversion of Titles Act) fundamentally affected tenure on State land in Zambia (and to some extent on customary land) and established a set of tenure categories which largely persist to the present day, despite subsequent land laws.

The variable for point scores for fixed investments (see below) is similarly adjusted to exclude any pre-1975 installations.

If a case did not report the year of installation of a fixed investment, and no corroborating data indicate it, it is counted as if it were post-1974. The vast majority of reported fixed investments were post-1974, so to exclude investments without reported years runs a greater risk of distortion than including them.

A-1.2: Point-Scoring System for Fixed Investments

The measurement problems that may arise from using cost estimates can be reduced by using an artificial point system, in which investment types are assigned a point score instead of a cost. This too has a risk of measurement error, as the point value of each type of investment is in a sense arbitrary (though defensible), and quality variations are not accounted. But the risk of not comparing and aggregating different kinds of investments is greater, because it departs from, or fails to reflect, the reality reflected by the data. The key is to develop a basis for assigning a point value to each kind of investment that does not merely reproduce or transform the mean cost calculations—not because cost is unimportant, but because it is difficult to estimate reliably. If the results are consistent with both cost and points, the conclusions are stronger.

Obviously it is easy to compare a respondent who has one well with a respondent who has three. It also seems reasonable to compare the respondent with one well with a respondent who has 200 meters of drainage canal, if we feel confident that the two installations represent a similar investment (of labour and/or materials). The trouble is obviously in the units: is 200 meters of drainage canal a fair equivalency for a well? A reasonable ratio must be sought. In any particular case it depends on the characteristics (depth, use of

durable materials) of the well and canal. The average investment equivalency between wells and canals in the sample may actually be 150 meters of canal per well, or 250. But it seems unreasonable to suppose that it would be 1,000. We aim to get the order of magnitude right.

Multiple points are awarded to larger, indivisible investments, like boreholes and concrete houses. (Fencing, a common major investment, falls into this category because in order to be useful it is usually installed in large quantities: e.g. 400 meters to enclose one hectare.¹⁵⁹)

Relative to using costs of fixed investments as dependent variable, this method aims to avoid the heavy estimations of the former, or more precisely, to replace one method of estimation with another, to see if the results are consistent. It is a compromise between the measurements of raw quantities and of estimated cost: it allows for gradations of intensity, or effort, or cost, but on a less volatile scale than that of cost. It accounts for the obvious difference between, say, a well and a borehole, but not at the very high ratio¹⁶⁰ that the cost estimates produce.

Effectively this will be an ordinal scale, treated for regression purposes as interval-level. Table 7.6 shows the point value assigned to each type of investment. The number of units required for each point is based on a common-sense estimate of equivalency of cost and effort: for instance, both wells and tree-planting are in the 2-point category, and we estimate that the number of trees to be planted (and maintained) to constitute an effort similar to that required for digging a well, is 25 trees. (We might equally have put trees in the one-point category, at a ratio of 12.5 trees per point.)

¹⁵⁹ Data were not collected on the fencing material used, whether wire or local materials such as thorn bushes. Using the latter requires no small effort, so it is argued that it is a comparable investment to fencing with bought materials.

¹⁶⁰ Kw 4,321,300 : 129,009, or about 33 : 1, to be precise.

Table 7.6: Point valuations for types of fixed investment

Description	Points	Types	Units = Point(s)	Comments
Labour only	1	Manuring	1 ha	
		Crop Rotation	2 ha	less effort than manuring, hence unit doubled to equal 1 pt
		Drainage	100 meters	
		Terracing	0.75 ha	Requires moving earth; more effort than manuring.
		Pot-holing	0.75 ha	Similar effort to terracing.
		Bunding	1 ha	
		Contour ridging	1 ha	requires only ploughing along contour lines; minor extra effort.
Labour + small amount of purchased materials	2	Well	per well	
		Tree (windbreak)	per 25 trees	We suppose that buying, planting and maintaining 25 trees is similar cost and effort as digging well.
		Tree (crop)	per 25 trees	
Labour + moderate amount of purchased materials	3	Burnt brick house	per house	
		Storage structure	per structure	
		Fencing	per 500 meters	
		Dip tank	per tank	
Large amount of purchased materials, with or without labour	4	Concrete House	per house	
		Borehole	per borehole	
		Dam	per dam	

Each case therefore yields an aggregate investment measure which is the sum of points for each type of investment that that household has.

A-1.3: Household Income

Reported revenue from sales of the recent (2001) harvest was included in the calculation of household income. However, many households had not (yet) sold their maize, either in

order to keep it for seed and subsistence, or to wait for better prices. The question therefore arises how to value harvest not yet sold. A related question is how to estimate how much of the harvest will or would be sold, as some is presumably retained for food and seed. So as not to enter into too much guesswork about subsistence requirements per capita of household population, it is decided to treat all harvested maize equally, and to value unsold maize at the mean reported producer price, for purposes of calculating household income. (This might be deceptive if we wished to estimate actual disposable income per household, but we are more interested in using income as a control variable in regressions, for which purpose this equal treatment is adequate.) The same treatment is applied to other unsold crops. Where sales and prices were reported, those figures will be counted as reported towards household income; and the unsold balance, if any, valued at mean price (not price reported by that case). Table 7.7 shows mean reported prices received by respondents per crop type.

Table 7.7: Mean market prices for produce

Mean price received for cotton	Kw 889 / kg (<i>n</i> = 68)
Mean price received for local maize	Kw 240 / kg (<i>n</i> = 12)
Mean price received for hybrid maize	Kw 247 / kg (<i>n</i> =35)
Mean price received for sunflower	Kw 398 / kg (<i>n</i> =51)
Mean price received for groundnuts	Kw 240 / kg (<i>n</i> =26)
Mean price received for sweet potatoes	Kw 267 / kg (<i>n</i> =24)
Price received for (mixed) beans	Kw 400 / kg (<i>n</i> =1)
Mean price received for cowpeas	Kw 1,429 / kg (<i>n</i> =3)
Mean price received for paprika	Kw 2,500 / kg (<i>n</i> =2)
Price received for soyabeans	Kw 840 / kg (<i>n</i> =1)

For mixed beans, cowpeas, paprika, and soyabeans, the cases who reported no sales or specified no price will have zero value imputed for those crops. (The extremely low number of price observations makes assigning mean value too unreliable.) The few cases who did report sales and prices for those crops will have that revenue counted towards income.

In valuing unsold portions of crops, the validity of substituting mean price for the price each case reported receiving may be impeachable, because it risks understating differences in incomes between those well-positioned in the market and those more disadvantaged.

However it should be remembered that reported prices themselves are subject to the vagaries of respondent recall. Almost no respondent cited a per-kilo price; mostly it was a price per 90kg (approximately) sack, or a bulk price for a number of sacks. While reported prices for all major crops had central tendencies and a plausible mean, indicating that respondent recall was for the most part accurate, one can expect a degree of respondent error, which may well be more than the difference between the report and the mean. The distortion introduced by substituting the mean in order to value unsold crops, therefore, is not likely to be greater than the distortion already presumably contained in the data by recall that is less than mathematically perfect.

Producer prices for maize fluctuate throughout the year, and are normally lowest at harvest time due to peak supply. For that reason, the unit value applied to unsold harvest for purposes of calculating household income will be the mean reported price received for that crop over the whole sample, rather than the price received for that case's sold portion of the harvest. For those cases whose reported prices differ substantially from the mean, this may have the effect of centralising their crop value (and hence calculated household income), and levelling the distribution of incomes. However this is equally valid as re-applying each case's reported price (where reports exist), because depending on the timing of future sales, their future prices received may differ considerably from the current report. Neither method therefore contains a greater risk of distortions than the other.

Crop input costs were subtracted from revenues to produce net income. (Non-crop production costs, such as putative veterinary fees, were not recorded.) Many inputs were acquired on credit. The majority of credit use in planting season 2000-2001 consisted of in-kind loans of seed (mostly hybrid maize, with some cotton, sunflower or other cash crop) and/or fertiliser. Most of these loans could be repaid similarly in kind, at for example fixed rates of harvested maize for borrowed seed. There were a few dozen cases where respondents could not recall or did not know the exact in-kind amount to be repaid (the main lender, the Food Reserve Agency, announced the repayment rates for current fertiliser loans only in the month preceding the survey, and the repayments were not yet due). Normally this failure to respond would be entered as a missing value. However, if that missing value were maintained, the calculation of household income for the whole case would also be null. To best utilise the other data on household income, it is decided to impute repayment amounts for those cases, to be used only in the calculation of household incomes. The amounts imputed are calculated at the same rates as prevailed for other FRA borrowers.

For those who borrowed from FRA, the equivalent market value of maize in the amount required to repay the loan is assigned as the cost of the (borrowed) input.¹⁶¹ This assumes that households would repay under the favourable in-kind terms rather than the disadvantageous cash terms.

In the handful of cases where borrowers cited an interest rate but could not report an exact repayment amount, an amount is imputed equal to the mean cost of that input reported by other respondents, plus the cited interest rate for that case. In cases where respondents reported the amount (in-kind) of materials borrowed but could not specify the charge or repayment amount, the FRA rates for fertiliser and hybrid seed repayment (Table 7.8) are imputed, again only for the purposes of calculating household income.

Table 7.8: Mean input market costs and Food Reserve Agency charges

Mean reported fertiliser market cost	Kw 1,001 / kg
FRA cash charge for borrowed fertiliser	Kw 1,333 / kg
FRA maize charge for borrowed fertiliser (market value of maize/ kg fertiliser)	Kw 735 / kg
Mean hybrid maize seed market cost	Kw 3,106 / kg
FRA hybrid maize seed repayment rate (market value of maize/ kg hybrid seed)	Kw 1,110 / kg
Mean cotton seed market cost	Kw 4,629 / kg
Mean sunflower seed market cost	Kw 2,629 / kg

Of course, one year of income data is imperfect as a control variable with a possible causal relationship to fixed investments, almost all of which in the sample predated the 12-month period before the survey for which income data were collected. Therefore income for 2000/2001 actually serves as a proxy for household income over the whole period in which investment decisions were made. We also recognise that fixed investments themselves may be causing increased income, rather than the reverse; this is especially

¹⁶¹ The FRA offered two repayment options for borrowed fertiliser: payment in cash at a rate of Kw 66,666 per 50kg bag of fertiliser (Kw 1,333 / kg); or payment in the form of white maize at a rate of 150kg maize for 50kg fertiliser. The mean price received for maize (i.e. sold, but not to FRA) reported by respondents was Kw 245/kg. Therefore to repay fertiliser with maize required maize of a market value of Kw 735 per kg of fertiliser. This compares to a reported mean market cost of fertiliser of Kw 1,001/kg, and the FRA cash repayment rate for fertiliser of Kw 1,333/kg. The scheme thus favoured repayment in maize rather than cash, i.e. the terms over-valued maize with respect to fertiliser, in keeping with FRA's objective of building a maize stockpile.

true with old investments and current income. We are examining a history of fixed investment decisions, and ideally we would match that with an income history; however respondents could not be expected to recall such income data in any usable quantitative form, whereas they often can with their fixed investments.

A-1.4: HHH's Children's Educational Attainment

Considerable confusion arose in collecting data on a household's, and a head-of-household's, children. Multiple spouses, the practice of sending children to a relative's household (either temporarily, or permanently if for example due to orphanhood), and cultural norms wherein children of relatives can in certain circumstances be adopted and referred to as one's own, made it hard for enumerators to separate the head of household's own children from others. It was thought useful to do so, because of the variation in degrees of permanence of these other children in the household: some might be orphaned and adopted, others might be living in the household only for the school year because of proximity, or only for the agricultural season; others might be there under longer-term but not permanent arrangements. It was thought that this made a difference to measuring children's educational attainment, on the supposition that the HHH's own children would receive at least equal, and usually superior, support from the HHH in getting through school, in comparison to other people's children living in the household; and thus it would be more accurate to compare the educational attainment of the HHH's children only. However it proved difficult in practice to collect sufficiently specific data.

The objective is to develop a variable that serves as an index of children's educational attainment, in order to compare this attainment across households. The ideal would have been to measure how many of the HHH's children of each age group had completed the grade expected for that age group (14-16 yrs. → 7th grade; 17-20 → 9th grade; >20 → 12th grade). This amounts to a measure of what percentage of children, of any age, are "on track" for grade completion, thus allowing comparison across young and old families. Unfortunately, the quantities resulting from this calculation included frequent nonsensical values greater than 1 (the values should have ranged between 0 and 1, as they are essentially percentages). The reason is that the denominator consisted of the HHH's children specified for each age group, whereas for the numerator (children who completed each grade), many respondents apparently included other people's children living in the household. The numerator therefore frequently exceeded the denominator.

To avoid the influence of this measurement error, a second, somewhat cruder index of offspring's educational attainment is calculated, consisting of reported number of completers of a grade (7th, 9th, or 12th) divided by the total number of the HHH's own children (including those who live elsewhere). A separate calculation is made for each of the three marker grades (and each grade is counted as cumulative, in the sense that those who completed 12th grade are counted as having completed 7th and 9th in the variables for those grades as well).

Families without children, or whose children are all under 14 (and hence too young to have completed 7th grade), yield a missing value and are necessarily excluded from the analysis. Therefore these measures of educational attainment inevitably refer to a biased sub-sample including only older families.

The final formulation is as follows. Three separate variables are derived, referring to attainment of 7th, 9th, and 12th grades:

- ◆ For 'hhhch7at' (proportion of HHH's children attaining 7th grade), the calculation is: total number of reported completers of 7th grade (including those who went on to complete 9th or 12th grade), divided by total number of HHH's children ('hhhchlth') less those under 14 years of age ('chl_14tt') (i.e. too young to have completed 7th grade).
- ◆ For 'hhhch9at' (proportion completing 9th grade), similarly the calculation is total completers of 9th grade including those who went on to complete 12th, divided by total number of HHH's children less those under 17.
- ◆ For proportion completing 12th grade, the denominator is total number of HHH's children less those under 20 years old.

These variables should range between 0 and 1. Therefore there are two possible kinds of nonsensical values: negative, and greater than one. Greater than one is due to the numerator (completers of the grade in question) being too big, probably reflecting inclusion of children other than the HHH's own. Negative values must be due to negative denominators, meaning that the reported numbers in the age category being subtracted amount to more than the total reported number of HHH's own children, again probably due to confusion about which are considered the HHH's own. Some cases have values that are both negative and greater than (absolute value) one. The way to treat these nonsensical values is:

1. **VALUES > 1:** These cases reported more grade completers than HHH's children. Since the variable aims to measure educational track or attainment of households with respect to location and tenure status, it makes sense to treat these cases who report 'excess' grade completers as having the maximum meaningful value of '1.'
2. **NEGATIVE VALUES:** The absolute value will be adopted, subsequently (where necessary) reduced to '1' from values greater than one.

The three variables for 7th, 9th and 12th grades were combined into an overall score by adding the z-score of each of the three individual-grade variables. This aggregate index has an unlimited range, but in practice ranges from 0.00 to 8.00.

There are many cases with missing values for the children's educational attainment variables (124, out of a sample of 266). It might be feared that there is a pattern towards missing responses, thus introducing a bias. However, one-way ANOVAs on a dependent variable that simply reflects whether or not the value for the educational variable is missing, showed that no significant difference exists with respect to the variables for State vs. customary land, HHH's highest grade finished, whether or not the respondent him/herself was head of household, and HHH age. In other words, there is no pattern of missing responses across categories of these antecedent variables, suggesting that the missing responses are indeed random and unbiased (except, as mentioned, households whose children are all under 14, and thus too young to have finished 7th grade, are also treated as missing, and thus the sub-sample is biased upwards in age).

A-1.5: Distance to Market

Three relevant questions were asked to respondents: where they buy seed and fertiliser (recorded in terms of km from HH), where they sell their maize (same), and how often have they received visits from agricultural extension agents. After tabulation, the latter question was dropped from the index, as 128 cases (48%) had had no contact with agents in the last 12 months, or ever.

Distance to market is included as a control variable largely because of its important role in Carter et al.'s Kenya study (1994), wherein the authors found that 'market access' (as they put it) had a mediating role in the causal path, influencing tenure status as well as productivity and other dependent variables. In other words, people with 'better' farms

(closer to market, better soil quality etc.) tended to seek titles to protect their more valuable land, which in turn would produce more. Carter et al.'s 'market access' composite variable is defined fairly loosely as a bundle of characteristics ranging from road access to credit supply. (Such a broad definition obviously risks causal circularity, as it is hard to separate the causal effect of land tenure on credit supply from other causal effects.) In the current study, distance to market is not expected to be pivotal, because the sample was designed to avoid this problem by focusing on a narrow sub-region with broadly common agro-ecology, soil quality, and distance to markets.

In our sample, responses for distances to buying and selling points had the following characteristics. Distance to point of buying seed and fertiliser had a range from 0 (for HH's who retained their own seed) to 35 km. Distances to points of sale varied from 0 (for those to whom buyers came) to 45 km. The latter had a half-normal distribution with a mode of under 5km, reflecting the fact that in harvest season, buyers prowl the area looking for producers.

By contrast, distances to points for buying inputs had a more bimodal distribution, with one mode between 0 and 10 km, and another around 25 km. Hence the majority of farmers either kept their own seed (hence zero distance to point of purchase) or were able to buy it nearby, but a significant number had to travel to get it, which is consistent with what would be a sensible business practice on the part of merchants of travelling off road to buy bulk maize from farmers, but declining to do so to sell a few kilos of seed to them.

Since the dirt and tarmac roads in this area are good enough that merchants are happy to travel more than 45km to buy bulk maize from farmers, it seems sensible to doubt that distance to market in this geographically focused sample is a major factor in farming decisions. Since the maximum distance to market in the study area is about 45km, it is likely that the timing of maize sales influences the price received much more strongly than distance from market.

Nonetheless we create an index which is calculated simply as the mean of the two variables, i.e. each case's reported distance to point of buying inputs and point of selling produce. (Some cases will be missing, as there are households that do not sell maize or buy inputs.)

A-1.6: Endowment from Parents

Three relevant questions were asked: HHH's father's educational attainment (highest grade completed), HHH's father's main work, and HHH's father's land holdings (in hectares). Each question resulted in some missing data. For HHH's father's main work, the answer in 165 cases was small farmer (78% of valid responses). The balance were a mixture of teacher or other civil servant/salaried worker (collectively 15% of valid), mines / factories / other industrial work (3.5% of valid), and miscellaneous others. As the purpose of a control variable like parents' wealth is to differentiate, a component of the variable that fails to differentiate is not useful. We therefore drop this variable from the index.

The remaining two variables showed better variability. HHH's father's highest grade finished ranges from 'none' (28.5% of valid responses); grades 1-4 (a further 28.5%), 5-9 (37.4%), and grade 10 or over (5.6%). There were 87 missing responses (37.2% of whole sample). HHH's father's land holdings ranged from 1 ha or less (8.2% of valid), 1.2 – 5.0 ha (22.7%), 6-10 ha (24.1%), 12-25 ha (20.5%), and 30-2000 (24.5%). There were 46 cases of missing values (17.3% of whole sample).

It would be best to be able to use the cases with missing data, lest the whole case be lost from regressions. How then to treat the missing data? It may be permissible in this instance to substitute the mean (or median, or mode). Again, we wish to see if control variables like parents' wealth have their own significant effect on the dependent variables, and especially to see if they provoke a spurious correlation between the dependent and the independent variables of interest. As long as a case has reported data for at least one of the two component variables, some differentiation will be contributed to the analysis. Examination of the dataset shows that 25 cases (9%) are missing data for both variables; the rest have data for at least one of the components. Combining the reported datum for one with the substituted mean for the other should preserve some of the differentiating power of the composite index score. For the 25 cases where both components are necessarily substituted means, we argue that the 9% of total cases that this represents is too small a figure to dilute the index's utility as a control variable, i.e. too small to falsely support the null hypothesis that parents' wealth has no effect on the dependent variables.

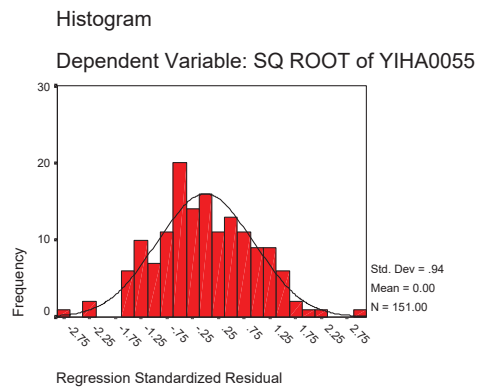
HHH's father's educational attainment shows a mean of 4.25 (4 = Standard 3 / Grade 4) and a median of 4 (= same). The mode is zero (no grades completed). With these statistics, it is appropriate to use the median as the figure to be substituted.

HHH's father's land holdings show a more divergent distribution: mean is 32.4 ha and median is 10 ha. The mode is also 10 (probably indicating that some respondents guessed a round figure). There is considerable influence of outliers, as the maximum is 2000 ha. Therefore we select the median and mode of 10ha as the figure to be substituted.

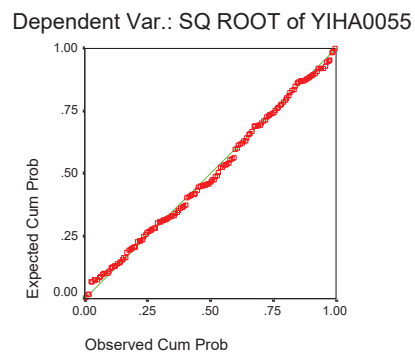
We next seek to combine these two variables into an index. Because they are both interval-level (arguably, in the case of educational attainment), it is necessary to convert them to z-scores so as to have common units. In the variable for HHH's father's land holdings, out of concern for the influence of the outlying maximum value of 2000 ha (which after all was merely reported, not confirmed, and equals an implausible 20 km²), we reduce it to 400 ha (arbitrarily but with some justification, as it will still be the maximum value for the variable, but is on the same order of magnitude as the next highest group of values).

Annex 2: LINEAR REGRESSION RESIDUALS PLOTS

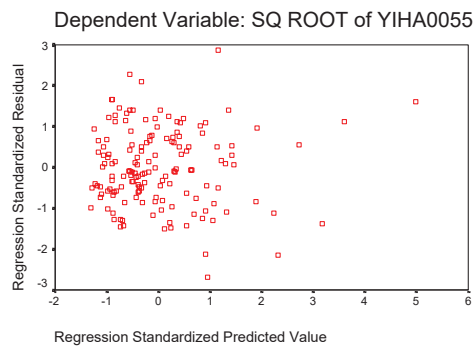
A-2.1: Table 6.6, Column 1 (Section 6.1.1.3): Determinants of hybrid maize yields



Normal P-P Plot of Regression Standardized Res

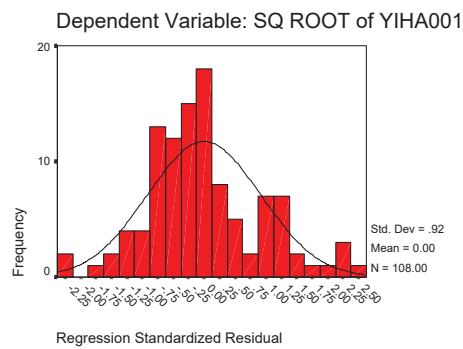


Scatterplot

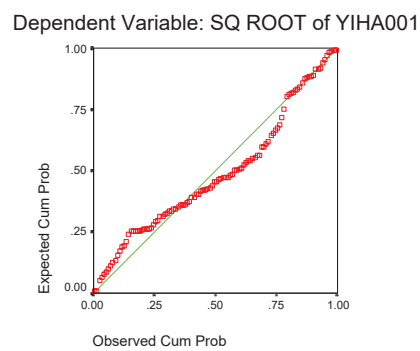


A-2.2: Table 6.6, Column 2 (Section 6.1.1.3): Determinants of local maize yields

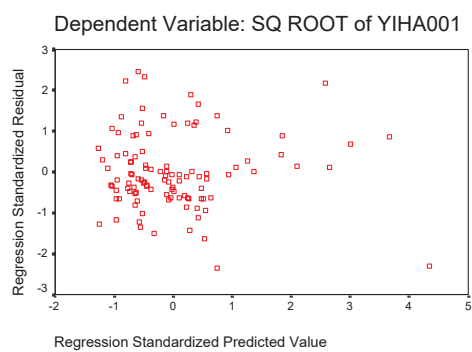
Histogram



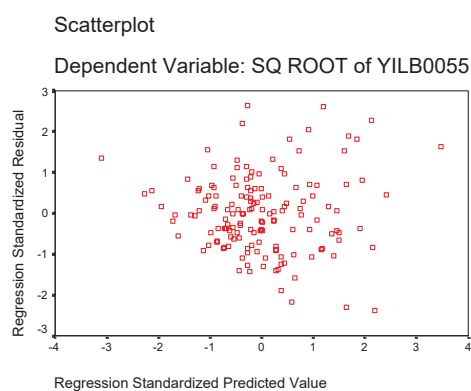
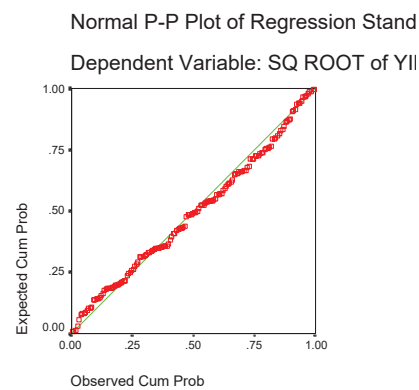
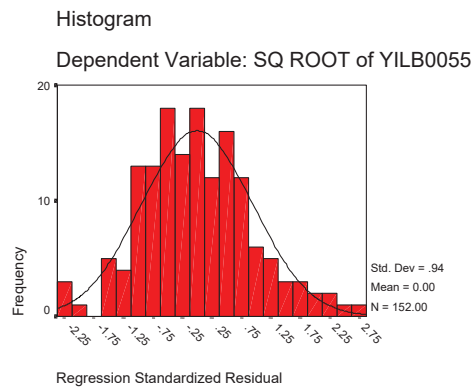
Normal P-P Plot of Reg. Standardized Resid.



Scatterplot

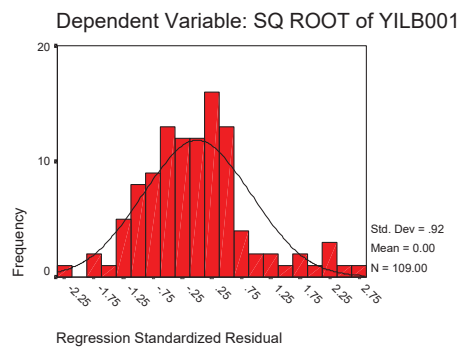


A-2.3: Table 6.8, Column 1 (Section 6.1.1.4): determinants of labour productivity for hybrid maize

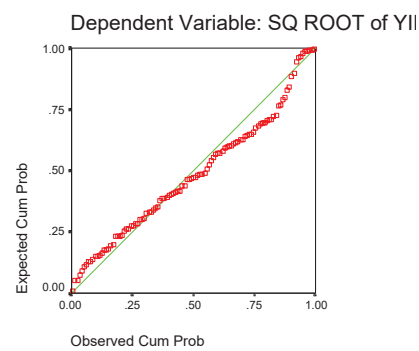


A-2.4: Table 6.8, Column 2 (Section 6.1.1.4): determinants of labour productivity for local maize

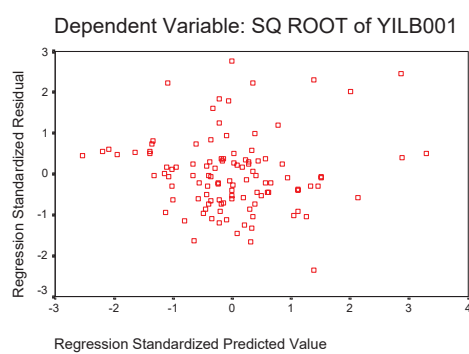
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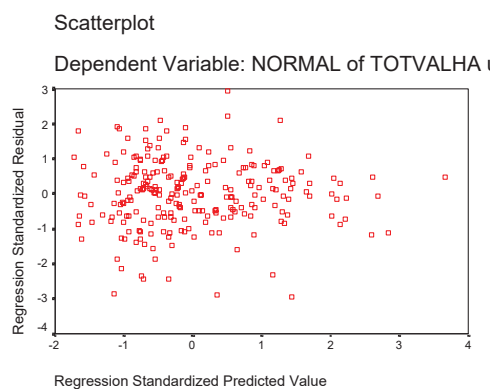
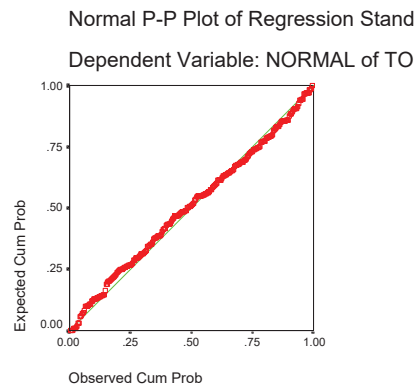
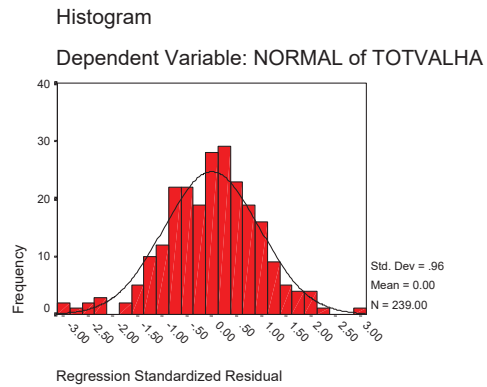
Normal P-P Plot of Regression Stand



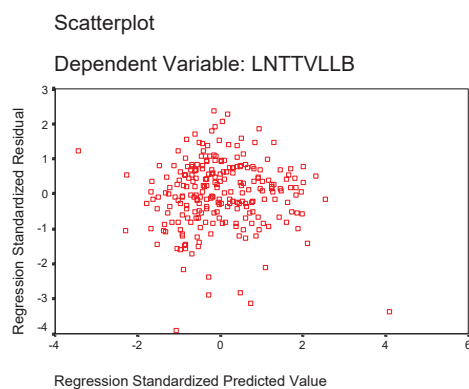
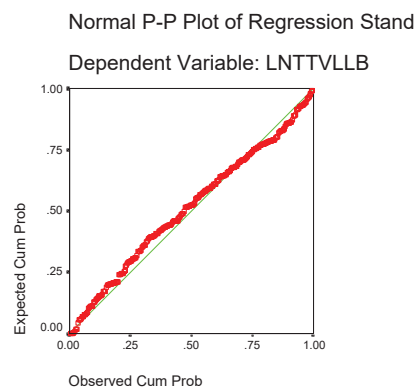
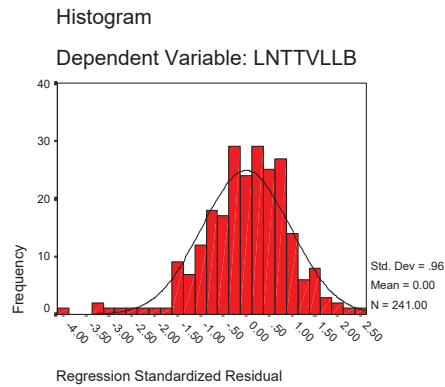
Scatterplot



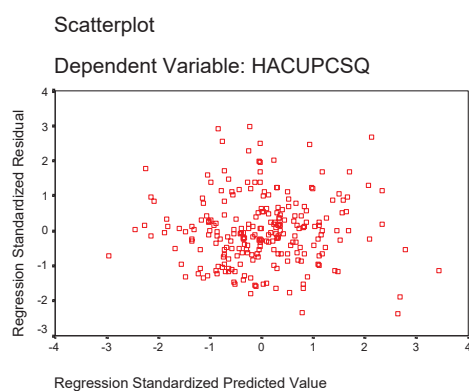
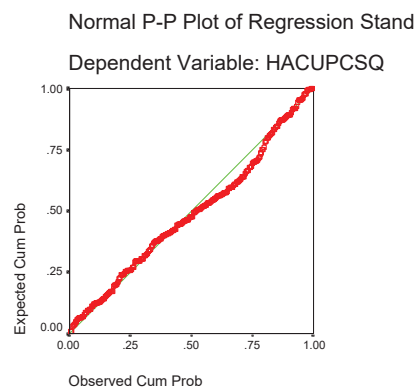
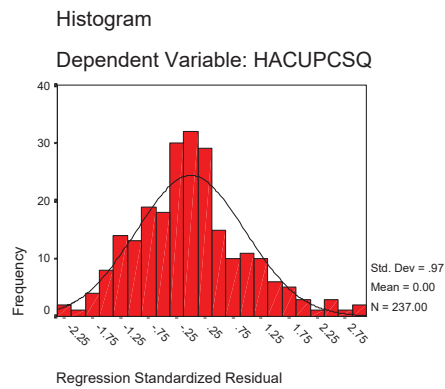
A-2.5: Table 6.9, Column 1 (Section 6.1.1.5): determinants of total crop value per ha cultivated



A-2.6: Table 6.9, Column 2 (Section 6.1.1.5): determinants of total crop value per unit farm labour force

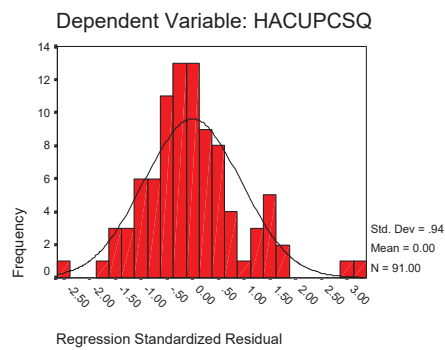


A-2.7: Table 6.19, Column 1 (Section 6.4.3.2): determinants of area cultivated per capita

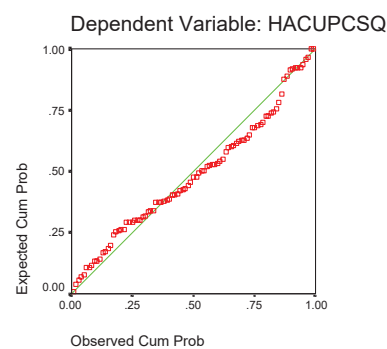


A-2.8: Table 6.19, Column 2 (Section 6.4.3.2): determinants of area cultivated per capita (customary land only)

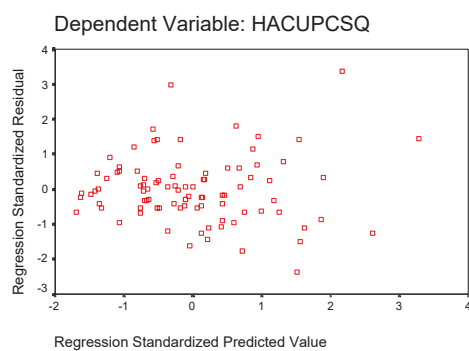
Histogram



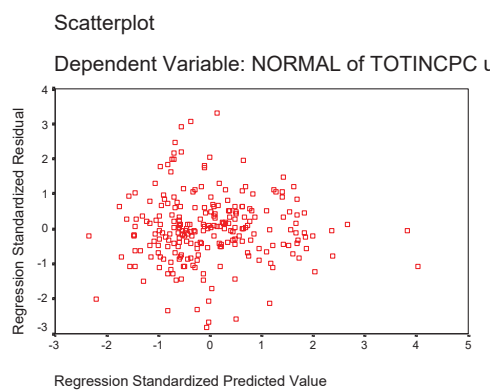
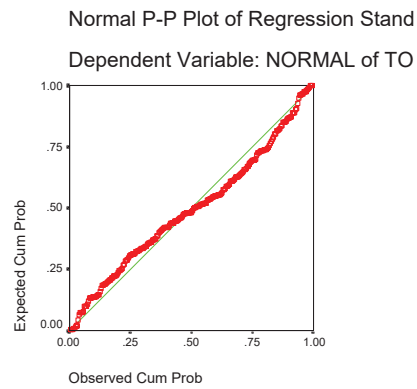
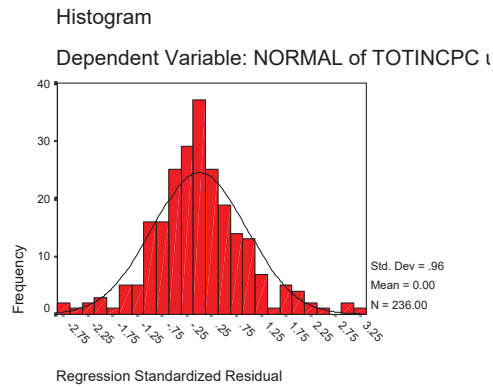
Normal P-P Plot of Regression Stand



Scatterplot



A-2.9: Table 6.23 (Section 6.5.2): determinants of household income per capita



Annex 3: SURVEY QUESTIONNAIRE

Village (or Settlement):	District:	Interviewer:	Date:
--------------------------	-----------	--------------	-------

Name of HHH: _____ Age: _____ Sex: _____

Name of Respondent (if not HHH): _____ Age: _____ Sex: _____

Respondent's relation to HHH: _____

HHH's Marital Status: 1= *single*; 2= *married*; 3= *widowed*; 4= *other*.

Size of HH--# children <12: [F] [M] 12-64 yrs: [F] [M] >64: [F] [M]

1.1. Respondent's highest school grade finished _____

1.2. HHH's spouse's highest grade finished: _____

1.3. HHH's highest grade finished (if respondent is not HHH): _____

1.4. HHH's **father's** highest grade finished _____

1.5. HHH's **father's** main work and location _____

1.6. HHH's **father's** land holdings: number of hectares (or acres/limas) _____ In what province and district? _____

1.7. Number of HHH's children living in HH _____

1.8. Age & gender of each? (e.g. F1-5 yrs; M1-3 yrs, F2-1 yr etc.) _____

1.9. Number of other children (e.g. relatives') living in HH _____

1.10. Number of HHH's children living elsewhere _____

1.11. Education status of HHH's children & dependents: Which of your children have completed 12th Grade? [e.g. M1, F3 etc.] _____ Which (others) have completed 9th Grade? _____ Which have completed 7th Grade? _____

1.12. **HHH's children work as:** [For multiple children, circle one item for each and note how many children work as such.]

- | | |
|------------------------------|-------------------------------------|
| a) full-time farmers? | e) Other (specify: _____) |
| b) Civil service? | f) Still in school |
| c) Other salaried worker? | g) Don't know yet |
| d) Business / trades people? | h) Not applicable / not working yet |

1.13 **What sort of work did you [HHH] mainly do before you started farming this parcel?**

- | | |
|--|---|
| a) full-time farmer on some other parcel | d) Business / trade |
| b) Civil service | e) Other (specify: _____) |
| c) Other salaried worker | f) None; I started farming on this parcel |

1.14. [If answer to 1.13 was (a) full-time farmer on other parcel] **Where was that previous farm?**

- Different parcel in this village /settlement scheme
- Other settlement scheme or State land
- Village on traditional lands next to this settlement scheme

- d) Village on traditional lands in this district but not next to this settlement
e) Village in other district or province

Household's GPS coords: _____

2000 Census Ward no.: _____ CSA no.: _____ SEA no.: _____ House Serial no.: _____

1990 Census (PHS) _____ CSA no.: _____ SEA no.: _____ House Serial no.: _____

Grey highlight = Supp Survey; Blue highlight = PHS

2. OPINIONS ON FARM PRODUCTIVITY:

2.1 We would like to learn about how people farm here. What are the most important things you can do to ensure a good harvest? (Interviewer: if respondent mentions more than 3, ask him/her to choose the 3 most important):

- | | |
|--|--|
| a) hybrid seed | h) planting at the right time |
| b) fertiliser | i) applying fertiliser at the right time |
| c) weeding | j) manuring |
| d) irrigation | k) Other (specify: _____) |
| e) animal traction | l) Don't know |
| f) pesticide | m) Refuses to answer |
| g) fixed improvements (specify: _____) | |

2.2 Were you able to do these this past season? (circle yes or no for each of the 3)

- | | | | | | |
|--------|-------|--------|-------|--------|-------|
| a. YES | b. NO | a. YES | b. NO | a. YES | b. NO |
|--------|-------|--------|-------|--------|-------|

2.3 If no, why not? (Interviewer: circle more than one response if necessary:)

- | | |
|--|--|
| a) lack of money | e) not worth it because produce prices not good enough |
| b) lack of credit | f) Other (specify: _____) |
| c) lack of labour | g) Don't know |
| d) the input is unavailable in local markets | h) Refuses to answer |

2.4 What types of crops did you grow this year? [Interviewer: follow up and ask for all the information to fill in this table. Put field crops in the first table, and garden crops in the Vegetable Garden Production table below.]

FIELD CROP PRODUCTION THIS YEAR (2000/2001):

CROP	AMOUNT OF SEED (sacks & kg)	AREA PLANTED (ha, lima, or acres)	YIELD		SALES & REVENUE		
			Unit & no.	Total Kg	Unit & no. sold	Unit price	Total
EXAMPLE	3 x 10kg	5 acres	40 x 90kg	3600	28 x 90kg	Kw 20,000	Kw 560,000
Kafwamba							
Maize							
Hybrid maize							
Groundnuts							
Sunflower							
Sweet potato							
Cowpeas							

Cotton							
Other *							

* **Codes for "Other":** 2= Sorghum ; 3= Rice ; 4= Millet ; 5= Sunflower ; 6= Groundnuts ; 7= Soyabeans ; 8= Seed cotton ; 9= Irish potatoes ; 10= Virginia tobacco ; 11= Burley tobacco ; 12= Mixed beans ; 13= Ground beans ; 14= Cowpeas ; 15= Velvet ; 16= Coffee ; 17= Sweet potatoes ; 18= Cassava ; 19= Kenaf ; 20= Cashew nuts ; 22= Oranges ; 23= Tangerines ; 24= Grapefruit ; 25= Bananas ; 26= Pineapples ; 27= Guavas ; 28= Paw paws ; 29= Avocado ; 30= Watermelon ; 31= Mangos ; 32= Other fruit ; 33= Cabbage ; 34= Rape ; 35= Spinach ; 36= Tomato ; 37= Onion ; 38= Okra ; 39= Eggplant ; 40= Pumpkin ; 41= Chilli ; 42= Choumolia ; 43= Cauliflower ; 44= Carrot ; 45= Lettuce ; 46= Green beans ; 47= Green maize ; 48= Other vegetables

Vegetable garden production this year (2000/2001):

Crop	Who tended it	Yield last 12 months	Income last 12 months

→ REPEAT FOR PREVIOUS SEASON (1999/2000), BUT ONLY IF RESPONDENT WAS NOT ON PHS SAMPLE. (We already have that info for PHS respondents.)

2.5 Did you want to grow more of any of these crops (both field crops and vegetables)?

1. Y 2. N Which one(s)? _____

2.6 Why didn't you manage to grow more of that? (Interviewer--circle responses:)

- | | |
|---|--|
| a) Not allowed (specify--prohibited by whom _____) | f) Not worth it because produce prices not good enough |
| b) Lack of credit | g) Don't need to |
| c) Lack of land | h) Other reason (specify: _____) |
| d) Lack of labour | i) Don't know |
| e) Lack of other inputs (specify which inputs: _____) | j) Refuses to answer |

2.7 Do you think the soil quality here on your farm is better than other farms in this village [or settlement]? Worse? About the same? (Interviewer--circle one: 1. Better 2. Worse 3. About the same 97. Don't know 98. Refuses to answer 99. N/A)

3. OPINIONS ON TENURE:

3.1. Is your farm on State land or customary land? 1. State 2. Customary 97. Don't know 98. Refuses to answer 99. N/A

3.2. Do you have any sort of document regarding your land rights? 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A

3.3. If yes, what document do you have?

- | | |
|---|--------------------------------|
| a) Title deed | d) Chief's or headman's letter |
| b) Lease (enter length of lease: _____ years) | e) District Council's letter |
| c) Private rental | f) Other (specify: _____) |

3.4. [FOR LEASEHOLDERS AND TITLEHOLDERS ONLY] a. What year did you first obtain the lease? 19 _____ b. For how many years was it valid? _____ c. How many times have you renewed it? _____ d. How many years is the current lease valid? _____

- 3.5. **If you wanted to shift, could you sell the lease to anyone?** 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A
- 3.6. **Can your children inherit the lease?** 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A
- 3.7. **Would you be willing to pay a higher ground rent, say twice as much per year, if you could extend the lease for twice as long?** 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A
- 3.8. **I want to ask you which of the different kinds of land rights are most important. Since the authorities don't always have enough time to pay attention to everything, we are trying to make a recommendation about which rights are most important for farmers. I want to show you a list of various land rights [using cards], and I'd like you to arrange them, starting with what you think is the most important, then the second most important, all the way to the least important. [Interviewer: write the numbers next to each of the following lines—1 for most important, 2 for second most important, etc.]**
- | | |
|--|--|
| a) Title | e) Right to cultivate the land as long as you want |
| b) Right to sell the land to anybody | f) Right to install fixed agricultural improvements on the land, like fencing or trees |
| c) Right to use the land for collateral for credit | |
| d) Right to bequeath the land to your children | |
- 3.9. **[If under customary tenure] Has there been a change, let's say in the last 5 years, in the way that the customary authorities are ruling land?** 1. Yes 2. No 97. Don't know 98. Refuses to answer 99. N/A **If so, how?** [summarise: _____] **Do you think it is a change for the better?** 1. Yes 2. No 97. Don't know 98. Refuses to answer 99. N/A
- 3.10. **Who has the final authority over your land?**
- | | |
|---|---------------------------------|
| a) Respondent (HHH) him/herself | f) Respondent's (HHH's) chief |
| b) Respondent's (HHH's) mother's family | g) Settlement scheme management |
| c) Respondent's (HHH's) father's family | h) District council |
| d) Respondent's (HHH's) community | i) National government |
| e) Respondent's (HHH's) headman | j) Other (specify: _____) |
- 3.11. **Do you make any contributions or gifts to this person, or people? (Like some buckets of maize, or some labour?)** 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A
[If NO, skip to q. 3.17]
- 3.12. **Can you estimate what you have given them, and how much, in the last 2 years all together?** [Interviewer: this could include services like labouring in the person's fields, so maybe probe for that.]
- | | |
|---------|---------|
| Item 1: | Amount: |
| Item 2: | Amount: |
- 3.13. **[If the response to question 3.7 was not Respondent's Chief] Do you make any such contributions to your chief?** 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A
- 3.14. **If so, can you again estimate what and how much in the last 2 years?**
- | | |
|---------|---------|
| Item 1: | Amount: |
| Item 2: | Amount: |
- 3.15. **[If the response to question 3.7 was not Respondent's Headman] Any such contributions to your headman?** 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A
- 3.16. **What and how much?**
- | | |
|---------|---------|
| Item 1: | Amount: |
| Item 2: | Amount: |

3.17. **When you are deciding whether to make long-term investments on the land, like planting trees or practising soil conservation, do you consider your land tenure status?**

1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A

3.18. **Do you feel confident that you can keep your parcels as long as you want?** 1. YES

2. NO 97. Don't know 98. Refuses to answer 99. N/A

3.19. **What about other farmers you know around here--do you know of any whose tenure status has changed, (for example, getting a title or a letter from the Council)?** 1. YES 2. NO

97. Don't know 98. Refuses to answer 99. N/A

If YES, in what way have they changed? (specify: _____)

3.20. **Would you like to change anything about your tenure status?** 1. YES 2. NO

97. Don't know 98. Refuses to answer 99. N/A [If NO, skip down to 3.24]

3.21. **[If YES] What kind of change would you like to make?** (Interviewer--circle response:)

- | | |
|--|--|
| a) You want a title | e) You want the chief or headman to have final authority |
| b) You want a lease | f) You want your clan to have final authority |
| c) You have a lease but you want to renew it | g) Other (specify:_____) |
| d) You have a lease but want a longer lease | |

3.22 Why do you want that?

- | | |
|--|--------------------------|
| a) Avoid risk of dispossession | e) Other (specify:_____) |
| b) Protect fixed investments | f) Don't know |
| c) To be able to bequeath | g) Refuses to answer |
| d) Use as collateral / better access to credit | h) N/A |

3.23 What is preventing you from getting that?

- | | |
|--|---|
| i) Chief won't accept it | p) Other won't accept it (specify) |
| j) Headman won't accept it | q) Too expensive to obtain it |
| k) Mother's family won't accept it | r) Takes too long to obtain it |
| l) Father's family won't accept it | s) I don't have enough influence to obtain it |
| m) Settlement management won't accept it | t) Other (specify:_____) |
| n) District council won't accept it | u) Don't know how to get it |
| o) Other government body won't accept it (specify:_____) | |

3.24. [ask if on customary land] **Can you tell me who decided that you should be allocated this land? (Please, maybe the chief or headman officially made the decision, but can you tell me who really was the most influential?)**

- | | |
|----------------------|--------------------------|
| a) Father | f) Chief |
| b) Mother | g) Other (specify:_____) |
| c) Father's relative | h) Don't know |
| d) Mother's relative | i) Refuses to answer |
| e) Headman | j) N/A |

3.25. To whom do you think your farmland should go after you?

- | | |
|---------------------------------|--------------------------|
| a) Respondent's own children | e) Chief |
| b) Respondent's mother's family | f) Other (specify:_____) |
| c) Respondent's father's family | g) Don't care |
| d) Headman | h) Don't know |

i) Refuses to answer

3.26. Does your tenure status affect your children's plans about what kind of work they will do, in other words, whether they will be farmers? 1. YES 2. NO 97. Don't know
98. Refuses to answer 99. N/A

3.27. If YES, how does it affect them? (specify: _____)

3.28. Can I please ask if your mother and father are still alive?

- | | |
|--|--|
| a) Yes, both still alive | c) Father still alive, but mother died |
| b) Mother still alive, but father died | d) Both have died. |

3.29. [If either parent is still alive] And is he (/she/they) still farming all of their land?
1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A

3.30. [If response to question 3.26 was "Both have died", OR if response to 3.27 is "No," they are not still farming that land] Was your parents' farmland then allocated to you, or at least to you together with your brothers and sisters?

- a) Yes, to me alone
- b) Yes, to me together with my brothers
- c) Yes, to me together with my brothers and sisters
- d) Yes, partially to me and by siblings, and partially to _____
- e) No, it was allocated to father's relatives
- f) No, it was allocated to mother's relatives
- g) No, it was allocated to others (specify: _____)

3.31. Can you tell me who decided how to allocate your parents' farmland? (Again please, we are interested in who really decided, even if the authority officially belongs to the chief or headman!)

- | | |
|----------------------|----------------------|
| a) Father | f) Chief |
| b) Mother | g) Other |
| c) Father's relative | (specify: _____) |
| d) Mother's relative | h) Don't know |
| e) Headman | i) Refuses to answer |

3.32. What do you think is the best system for protecting people's land rights? (circle one)

- | | |
|---|--------------------------------------|
| a) Letting the mother's family control it | e) Letting the Government control it |
| b) Letting the father's family control it | f) Don't know |
| c) Letting the headman control it | g) Refuses to answer |
| d) Letting the Chief control it | |

3.33. [ask only if respondent said 'Government' to last question] If you say the Government should control it, how long do you think the lease should be for a farmer like you?

- | | |
|------------------|------------------------|
| a) 0 – 14 years | d) 99 years or 'title' |
| b) 15 – 50 years | e) Don't know |
| c) 50 – 98 years | f) Refuses to answer |

4. CREDIT:

4.1 Have you or someone in your household taken credit (either cash, materials or services) in the last 5 years? Would you be willing to share the details with me? [If YES, go to 'Borrowing History' table below and fill in details. If NO, skip to 4.4] 1. YES 2. NO
97. Don't know 98. Refuses to answer 99. N/A

Household's borrowing history, starting with loans that are currently running: [Interviewer: you may wish to prompt about borrowing from informal moneylenders.]

Recipient	Lender*	What was received	Amount	Collateral**	Charge or Interest ¹	Used for***	Duration of loan ²

* Lender codes: 1= Agricultural financial institution; 2= Co-operative society; 3= Commercial bank; 4= Private company; 5= NGO; 6= Out-grower facility; 7= FRA; 8=informal moneylender; 9=Other (Specify).

**Collateral codes: 1= None; 2= Livestock; 3= House; 4=Farm equipment; 5= Group guarantee; 6= Land; 7= Transport equipment; 8= Part of Harvest; 9= Other (Specify).

*** Use codes: 1= Purchase of short-term agricultural inputs; 2= Purchase of animals; 3= Purchase of equipment; 4= Purchase of vehicles; 5= Long-term inputs or fixed investments; 6= renting animal or mechanical traction; 7= hiring labour; 8= planted (if received seed/fertiliser); 9=Other (Specify).

Do you have any other comments about these loans that you've had? _____

4.2. Why did you choose to borrow from this (these) particular source(s)? [Interviewer: note on the line after each response which lender the respondent is referring to.]

- a) This source takes less interest / is less expensive _____
- b) This source gives bigger loans _____
- c) Doesn't require land as collateral _____
- d) Doesn't require any collateral _____
- e) Is more flexible and can re-negotiate the terms _____
- f) It's the only source possible _____
- g) Other (specify: _____)

4.3 How important was the credit to your farming production? [Ask to characterise as: 1. Absolutely necessary; 2. very important; 3. somewhat important; 4. not very important; 5. zero importance. 97. Don't know 98. Refuses to answer 99. N/A. Circle the response]

4.4 What possible credit sources can you use here (aside from the ones you've already mentioned in the Borrowing History)? What security do they require?

List: _____

CODES: 1=Agricultural financial institution ; 2=Cooperative society ; 3=Commercial bank ; 4=Private credit agent ; 5=NGO ; 6=Out-grower facilitator ; 7=Informal Moneylender ; 8=Other (Specify)

¹ Can ask how much more they had to repay than the original amount. The charge might have been paid in bushels of maize etc., in which case you can enter this info.

² Note the date when they received the loan and the date when it had to be completely repaid.

4.5 Have you or someone in your HH applied for credit but been refused, in the last 3 years?
1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A

4.6 If so, why were you (or the person in your HH) refused?

- a) No collateral d) Other (Specify: _____)
b) Defaulted on earlier loan
c) Inability to pay back

4.7 Within the last 3 years, did it happen that you (or someone in your HH) wanted credit, but decided not to apply for it? 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A

4.8 Why did you not apply for it?

- a) Inability to pay back f) I have no collateral
b) Lender is too far away g) Repayment period is too short
c) Interest rate is too high h) I don't need it
d) Wasn't aware of any sources i) Other (Specify: _____)
e) Defaulted on earlier loan j) Didn't like what they required as collateral

4.9 The next few questions have to do with what you think of different kinds of collateral. We know that interest rates also matter, but for now let's just imagine that we are talking about the same interest rates you had on your last loan, or the interest rates that the lenders are now requiring. First, if you didn't have to offer any collateral (security), would you take more credit, same amount, less credit, or zero credit? (Interviewer: indicate responses on table below) If you had to guarantee repayment with a portion of your harvest? If you had to offer your land as security (that means, if they could take part of your land or all of your land if you fail to repay)?

If... ↓	Would take more credit	Would take same amount	Would take less credit	Would take zero credit	Not sure, OR, it wouldn't make any difference	It depends on.... (write comments)
3.11.A--didn't have to give any security or collateral, then →						
3.11.B—had to secure with harvest, then →						
3.11.C—had to secure with livestock, then →						
3.11.C—had to secure with land as collateral, then →						

4.10 What would you do if you could get more credit? Would you... (can circle more than one)

- a) Plant larger fields? f) Use fertiliser, or more fertiliser?
b) Buy more land? g) Use more animal traction?
c) Rent more land? h) Buy more farm implements? (e.g. hoes, ox-ploughs, cart, tractor...)
d) Plant different crops?
e) Use hybrid seed?

- i) Hire more farm implements (e.g. the same
- j) Hire in more temporary farm workers?
- k) Build fixed improvements on the land? (specify what type: _____)
- l) Buy livestock
- m) Use the credit to buy food for your family?
- n) Use the credit for school fees, medicine, or other things for your family?
- o) Other (specify: _____)

4.11 Can you tell me what things do you consider when you are deciding whether to take credit, and how much credit to take? Do you consider...(can circle more than one)

- a) Interest rates / cost of the credit
- b) Risk of failing to repay
- c) Risk of losing the security or collateral
- d) Repayment period, or flexibility of repayment period
- e) The legal status of your land
- f) Your desire about what to plant and how much to plant
- g) Other cash needs, apart from the farming
- h) Other (specify: _____)

4.12 What are the main requirements when farmers around here apply for credit?

- a) Your land tenure status
- b) The amount of land that you have
- c) The amount of livestock you have
- d) The amount of crops that you normally produce
- e) Your credit history
- f) Social or family connections
- g) Farm equipment (e.g. ploughs)
- h) Fixed improvements on the farm (like irrigation)
- i) Other (specify: _____)

5. SHORT-TERM INPUT QUESTIONS:

5.1. What are the materials [inputs] that you use that have to be used again every year?

- a) Hybrid seed
- b) Chemical fertiliser (basal)
- c) Chemical fertiliser (top dressing)
- d) Animal manure
- e) Green manure
- f) Pesticide / insecticide
- g) Other (specify: _____)

5.2. Which of these materials (if any) also have long-term effects? (For instance, if you manure a field for several years, then plant that field one year without manure, will it still give a better harvest than before you started manuring?) [Interviewer: record any responses with same codes as 5.1] _____ 97. Don't know 98. Refuses to answer 99. N/A

5.3. Can you please share with me the information on the fertiliser and seed that you used for the past growing season? [Interviewer: get all the info to fill in these tables]

Fertiliser Costs this season (2000/2001) :

TYPE	AMOUNT	UNIT COST*	TOTAL COST	CROPS/ NOTES
Example: Top	8 x 50kg	K34.000	-----	Bad harvest—too much rain

*can be written as number of bags of a crop per bag of fertiliser (e.g. 5x90kg maize/1 bag fert.)

Seed Costs this season (2000/2001):

CROP	AMOUNT	UNIT COST	TOTAL COST	NOTES

→ REPEAT FOR PREVIOUS SEASON (1999/2000), BUT ONLY IF RESPONDENT WAS NOT ON PHS SAMPLE. (We already have that info for PHS respondents.)

5.4 Did you use any animal draught power or mechanical tractors this past season, for ploughing or planting?

- | | |
|-----------------------------|----------------------|
| a) Yes, animal draught | d) No, neither |
| b) Yes, mechanical tractors | e) Don't know |
| c) Yes, both | f) Refuses to answer |

5.5 [If YES to any] What was the main source of this power?

- | | |
|--------------|----------------------|
| a) We own it | d) Don't know |
| b) Hired | e) Refuses to answer |
| c) Borrowed | |

5.6 [If hired] Can you tell me how much it cost you to hire it? [in cash or kind] _____

6. LABOUR INPUT QUESTIONS

6.1. XXXXXXX [question deleted—go straight to 6.2]

6.2. Do you have enough labour to work as many fields as you wanted to plant?

1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A

6.3. Did you hire any temporary farm labour this past season? 1. YES 2. NO

97. Don't know 98. Refuses to answer 99. N/A

6.4. [If yes, get information to fill in Hired Labour table below.]

Hiring of Labour:

Type	# workers	Duration (unit & #)	Wage (cash or kind)	Total expenditure

7. LONG-TERM IMPROVEMENTS:

7.1. I want to ask you now some questions about how farmers can install things on the land that permanently help farming. Have you made any of the following long-term improvements on your land? [Go to Fixed Improvements table and run down the list, record positive responses, and double-check the information later when filling in the Field tables. If respondent answers none, prompt with some examples from the Fixed Improvement table, in case there's a language problem with 'long-term improvements.' At the end, ask if he/she has done any other things that he/she considers to be a permanent improvement or fixed investment, and enter under 'other.'.]

7.2. Are there some types of improvements that you would like to make, but cannot?
1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A [If NO, go to 6.5]

7.3. [If YES] What types? (Can circle more than one)

- | | | |
|-----------------------|----------------------------|-----------------------------|
| a) Terracing | h) Organic treatment | o) Paddocks |
| b) Bunding | i) Fencing | p) Improved grazing |
| c) Contour ridging | j) Tree planting | q) Firebreaks or fireguards |
| d) Well | k) Fish pond | r) Potholing |
| e) Irrigation | l) Grain storage container | s) Ripping |
| f) Drainage | m) Dam | t) Improved fallow |
| g) Chemical treatment | n) Dip-tank | u) Others (specify: _____) |

7.4. Why can't you do these? [Interviewer: note which response refers to which desired improvement]

- | | |
|---|---|
| a) Can't get enough credit | f) Not secure tenure on this land; or fear of being shifted |
| b) Don't have enough money | g) Material [e.g. fencing] would be stolen |
| c) Can't get enough labour | h) Neighbours wouldn't like it / Jealousy |
| d) Too expensive, given the risks of farming. | i) Other (specify: _____) |
| e) Not permitted (by whom? Specify: _____) | |

7.5. Do you think that, if you install some fixed improvements on your land, others would become jealous? 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A

7.6. Do you think that, if you made some of these improvements on your land, someone else might then try to claim the land? 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A

7.7. Would you be allowed to put up fences around your fields, if you wanted to?
1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A

7.8. [If NO] Why not?

- | | |
|---|---------------------------|
| a) Other people's grazing rights | c) Jealousy |
| b) Other people's rights of way (footpaths or cowpaths) | d) Other (specify: _____) |

7.9. Would you mind being shifted (with your family) to another parcel of the same size in this community? (We certainly don't want to shift you--just an imaginary question!)
1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A

7.10. [If YES] Why would you mind?

- e) Don't want to leave family land
- f) Don't want to lose the fixed improvements we've made
- g) Other (specify: _____)

7.11. Regarding these long-term improvements you have installed (refer to responses from 7.1), how do you know that you will keep this land long enough to make the improvement worthwhile?

- a) My clan respects/enforces rights to fixed investments;
- b) My headman respects them;
- c) My chief respects them;
- d) The State respects them;
- e) I don't think anyone would claim this land;
- f) I will seek title;
- g) State lease protects my land rights;
- h) other (specify: _____).

7.12. Did you cultivate all of your fields this year? 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A

7.13. If not, why didn't you cultivate certain fields?

- a) Intentional fallow
- b) Grazing
- c) Used for wood or tree products
- d) Renting it out
- e) Lending it out (without rent payment)
- f) Didn't have enough credit
- g) Didn't have enough seed
- h) Didn't have enough fertiliser
- i) Didn't have enough labour
- j) Didn't have enough animal traction
- k) Didn't have enough farm equipment
- l) Other (specify: _____)
- m) Don't know
- n) Refuses to answer

7.14. Would you like to fallow any of your fields, or to have longer fallow? [Interviewer: be sure that the respondent understands that we want to know whether he/she WISHES to fallow—not just whether he/she actually plans to do so. Then see next question.] 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A

7.15. [If YES] Why don't you then?

- a) Need the production every year / OR, don't have enough land to spare some for fallow
- b) Have to lend it out or rent it out
- c) People would challenge my land rights if I didn't cultivate it every year
- d) Other (specify: _____)

7.16. [ask only if on settlement scheme] Were there any land improvements that you were required to do? Which? Did you manage to do them? (Please trust me--I won't tell anyone if you haven't!) If not, why not?

7.17. [Ask only if on settlement scheme] Can you tell me, why did you choose to come farm on this settlement scheme?

- a) Better soil;
- b) Larger farm size;
- c) Infrastructure like roads and boreholes;
- d) Services like tractor ploughing or credit
- e) Leases / titles / land tenure security

- f) *Prefer to get away from village society;*
g) *Lost my lands in the village;*
h) *Other (specify _____)*
- i) *Don't know*
j) *Refuses to answer*
k) *N/A*

7.18. It seems to me that if a farmer wants to produce more, he or she can do it in two ways: cultivate more land, or cultivate the same amount of land more intensively. If you wanted to produce more, which method would you choose?

- a) *Cultivate more land;*
b) *Cultivate same land more intensively*
- c) *Don't know*
d) *Refuses to answer.*

7.19. Why would you choose that method instead of the other? *[Interviewer: we want to know why the respondent would choose to do (a) or (b)—e.g., there's no more land available for me to cultivate more.]*

a) *specify: _____*

7.20. And, what is preventing you from doing that now?

- a) *Constraint on land availability;*
b) *constraint on labour availability;*
c) *constraint on animal traction;*
- d) *constraint on credit;*
e) *constraint on bought inputs;*
f) *Other (specify: _____)*

7.21. Do you have to let other people's cattle graze on your fields during the dry season?

1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A

7.22. Does that [or would that] cause any problems for you or your farm? 1. YES

2. NO 97. Don't know 98. Refuses to answer 99. N/A

[If YES, specify what problem: _____]

8. FIELD CHARACTERISTICS:

8.1. Let's draw a map in the sand of your farm, showing the different parcels or fields. Please show the parcels as separated if you acquired them in different ways (for example, one parcel you inherited from your father, another you have borrowed from your uncle). *[Interviewer: sketch the fields here; show the distances of each from the house, and the rough size of each field; number each field (the field closest to the house is automatically No. 1), then fill in the following table for each (extra tables at the back). Include vegetable gardens. It would be best to speak with specific cultivator for each field, e.g. wife.]*

SKETCH : (on reverse of answer sheet)

FIELD Number One:

When acquired (year):	
Mode of acquisition:	1=inherited, 2=purchased, 3=allocated by traditional authority, 4=allocated by clan; 5=rented, 6=shared land, 7=given, 8=exchanged, 9=borrowed, 10=squatter, 11=government leasehold, 12=sub-lease (e.g. from Family Farms); 13= cleared the land myself; 14= <i>inter vivos</i> gift; 15=other (specify: _____).
Acquired from:	1= current headman; 2= previous headman; 3= current chief; 4= previous chief;

	5= local govt. authorities; 6= spouse; 7= husband's parents; 8= wife's parents; 9= husband's other relatives; 10= wife's other relatives; 11= private people; 12= free access/ self-given; 13= central govt (Min of Lands, Agric, Office of VP); 14= settlement scheme; 15= private company; 16= my parents; 17=other (specify)
Who cultivates:	1=husband; 2=wife; 3=sons/daughters; 4=other HH members; 5=extended family members; 6=others from community; 7=lessee; 8=other (specify)
Previous owners (w/ yrs):	
Tenure status changed since acquisition?:	1= title obtained (in year: ____); 2= lease renewed (____ years remaining); 3= lease extended (now ____ years long); 4= other (specify ____); 5=no change
Plans for parcel:	1=keep, 2=sell, 3=let, 4=bequeath, 5=no plans
GPS location:	
Distance from house (m):	
Parcel area (m X m):	
Fallow history last 5 years:	2000: Y N 1999: Y N 1998: Y N 1997: Y N 1996: Y N
Crop type(s) this year: (2000/01)	
Crop type(s) previous year: (1999/2000)	
COMMENTS / OBSERVATIONS: (other farming methods; soil quality 1-5)	<i>[Double-check info on Land Improvements table, just to be sure you know which field each improvement is on.]</i> Manuring? Y N Since year: _____

[repeat for additional fields if any--go to extra Field tables at end.]

9. MARKET ACCESS:

9.1. **Where do you buy your seed and fertiliser?** *[Interviewer: give name of village or town]*

9.2. **Where do you sell or trade your maize?** *[give name, but NOTE—if the buyer comes from e.g. Monze to buy in the village, then record it as selling the maize in the village, not Monze.]*

9.3. **Do you keep part of the maize harvest for seed?** 1. YES 2. NO

9.4. **Do you have contact with agricultural agents who can advise you on farming questions? (For example, people from the District Council agriculture office, from the School of Agriculture, from a church, or a farmers' group?)** 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A

9.5. **If so, where do you see these 'advisors'? —**

- | | |
|---|------------------------------------|
| a) here on the farm | f) I hear them on the radio |
| b) in this village | g) somewhere else (specify: _____) |
| c) at the agricultural station (where: _____) | |
| d) at the District Council | h) Don't know |
| e) at church | i) Refuses to answer |

9.6. **How often have you seen (or heard) these advisors in the last year?**

- | | |
|----------------------------|----------------------|
| a) Not at all this year | d) Many many times |
| b) Just once or twice | e) Don't know |
| c) More than once or twice | f) Refuses to answer |

9.7. **Would you like more contact with these advisors, the same amount, or less?**

- | | |
|----------------------|----------------------|
| a) Want more contact | d) Don't know |
| b) Same amount | e) Refuses to answer |
| c) Less | |

10. LAND MARKETS / LAND ACCESS:

10.1. **Would you like to have more land for farming if you could?** 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A [If YES, skip to 10.3]

10.2. [If answer to 10.1 was 'NO'] If you say that you DON'T want more land, why don't you want more? [Then skip down to question 11.1.]

- | | |
|-------------------------------------|---------------------------|
| a) Not enough labour | g) Jealousy |
| b) Not enough animal traction | h) Tenure insecurity |
| c) Not enough equipment | i) Other (specify: _____) |
| d) Not enough inputs | j) Don't know |
| e) Not enough credit | k) Refuses to answer |
| f) Farming is not profitable enough | |

10.3. [If answer to 10.1 was 'YES'] **If you say that you want more land, could you get it?** 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A [If YES, go to next question. If NO, skip to 10.5.]

10.4. [If answer to previous question was 'YES'] How could you get it?

- | | |
|--|--|
| l) Borrow some more fields | p) Migrate to another region or province |
| m) Rent some more fields | q) Lease State land |
| n) Ask headman for additional allocation | r) Buy State land |
| o) Ask family for additional allocation | s) Other (specify: _____) |

10.5. [If answer to 10.3 was 'NO'] Why couldn't you get more land?

- | | |
|---|--|
| a) No family lands available | f) I don't have money for renting, leasing or buying |
| b) No village lands available | g) I don't have labour to cultivate more land |
| c) Available land is too far away | h) I don't have animals to cultivate more land |
| d) I would have to give up my current parcel, and I wouldn't want to | i) I couldn't get the seed/fertiliser to cultivate more land |
| e) The headman / chief / settlement would not allocate more land for me | j) I wouldn't be allowed to cultivate more land |
| | k) Other (specify: _____) |

11. OPINIONS ON WEALTH ACCUMULATION:

11.1. **Do you think it is fair if a farmer is successful and uses the profits to buy or rent more land, assuming that he's not displacing anybody?** 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A

11.2. **Do you think it is fair if a farmer uses money from profits to build improvements (like fencing) on his or her land?** 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A

11.3. **Do you think it is true or false to say that: "If some people manage to get more wealth, that means other people must have lost wealth."** 1. TRUE 2. FALSE 97. Don't know 98. Refuses to answer 99. N/A

11.4. **True or false: "It is possible for someone to get more wealth without taking wealth away from other people."** 1. TRUE 2. FALSE 97. Don't know 98. Refuses to answer 99. N/A

12. DISPUTES / DISPLACEMENT / PERCEIVED SOURCES OF INSECURITY:

12.1. **Have you ever had to stop cultivating or leave any of your parcels or fields (including fields that you had before you came to this farm)?** 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A [If NO, skip to 12.3]

12.2. [IF YES] **We are very concerned when we hear that farmers lose their land. Why did you lose that parcel or field?** [Interviewer: you will probably have to prompt in order to fit the response into one of the codes below.]

- | | |
|--|---|
| a) Mother's family re-allocated it to someone else; | i) moved to smaller piece; |
| b) Father's family re-allocated it to someone else | j) widowed; |
| c) someone outside the family claimed it successfully; | k) insufficient labour to cultivate it; |
| d) headman allocated it to someone else; | l) insufficient animals for ploughing; |
| e) Chief allocated it to someone else; | m) insufficient seed; |
| f) Someone else got title; | n) insufficient fertiliser; |
| g) soil had lost fertility (or, wanted to leave it for long fallow); | o) lease not renewed |
| h) respondent moved to bigger or better piece of land; | p) failure to meet terms of lease (e.g. land development) |
| | q) Failure to repay a loan; |
| | r) Other (specify:_____) |
| | s) Don't know |
| | t) Refuses to answer. |

12.3. **Can you think of any other farmers in your village (or settlement), in the last five years, who have shifted off a piece of land they were farming, or lost a field?** 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A [If NO, skip to 12.5]

12.4. [IF YES] **Why did that farmer (or farmers) leave the piece of land they were farming?** [Interviewer: if the respondent can think of more than one case of dispossession, you can circle a response for each case.]

- | | |
|--|---|
| a) Mother's family re-allocated it to someone else; | j) widowed; |
| b) Father's family re-allocated it to someone else; | k) insufficient labour to cultivate it; |
| c) someone outside the family claimed it successfully; | l) insufficient animals for ploughing; |
| d) headman allocated it to someone else; | m) insufficient seed; |
| e) Chief allocated it to someone else; | n) insufficient fertiliser; |
| f) Someone else got title; | o) lease not renewed |
| g) soil had lost fertility (or, wanted to leave it for long fallow); | p) failure to meet terms of lease (e.g. land development) |
| h) That farmer moved to bigger or better piece of land; | q) Failure to repay a loan; |
| i) moved to smaller piece; | r) Headman expelled them for bad behaviour |
| | s) Other (specify:_____) |
| | t) Don't know |
| | u) Refuses to answer. |

12.5. **Aside from what you answered to the previous question about whether you've ever had to leave a parcel of land, have you ever been involved in a land dispute?** 1. YES 2. NO 97. Don't know 98. Refuses to answer 99. N/A [If NO, skip down to 12.11]

12.6. **If so, when?** (YEAR: _____)

12.7. **What kind of dispute?**

- | | |
|------------------------|--|
| a) Boundary; | e) rights to perennial (tree) crops; |
| b) Ownership rights | f) right to fence; |
| c) grazing rights; | g) water rights; |
| d) cultivation rights; | h) Right to rent out the land to someone else; |

- i) *Right to use land that you rented from someone*
- j) *Other (specify: _____).*
- k) *Don't know*
- l) *Refuses to answer*

12.8. With whom?

- a) *Father's family*
- b) *Mother's family;*
- c) *community member who's not from father's or mother's family*
- d) *someone from outside the community;*
- e) *Settlement scheme management*
- f) *District Council*
- g) *Other _____*

12.9. Who decided the dispute?

- a) *Mother's family*
- b) *Father's family*
- c) *headman*
- d) *chief*
- e) *District Council*
- f) *Settlement scheme management*
- g) *State court or magistrate*
- h) *Just me and the disputer*
- i) *other (specify _____).*
- j) *Don't know*
- k) *Refuses to answer*

12.10. What was the result? 1--Respondent won; 2--Respondent lost; 3--Compromise.

12.11. Do you think it is possible that others may try to claim ownership to your land? 1. YES
2. NO 97. *Don't know* 98. *Refuses to answer* 99. *N/A* [If NO, skip to 12.14]

12.12. Who?

- a) *Father's family*
- b) *Mother's family;*
- c) *community member who's not from father's or mother's family*
- d) *someone from outside the community;*
- e) *Settlement scheme management*
- f) *District Council*
- g) *Other _____*
- h) *Don't know*
- i) *Refuses to answer*

12.13. Do you think they'd be likely to succeed? 1. Yes 2. no 97. *Don't know* 98. *Refuses to answer* 99. *N/A*

12.14. [Ask only if respondent is on traditional lands] Does the headman, or the chief, or the clan, ever remove someone from his or her land, or order them to shift to another parcel? 1. YES
2. NO 97. *Don't know* 98. *Refuses to answer* 99. *N/A*

12.15. If so, what's the reason given?

- a) *Make room for others in community;*
- b) *make room for newcomers;*
- c) *bad behaviour;*
- d) *other _____.*

12.16. [FOR STATE LANDS ONLY] Have you and your family always been able to renew the lease on this land without much difficulty? 1. YES 2. NO 97. *Don't know* 98. *Refuses to answer* 99. *N/A*

12.17. [IF NO], What has been the difficulty?

- a) *Takes too long;*
- b) *costs too much;*
- c) *the authorities are difficult;*
- d) *ownership disputes;*
- e) *lease requirements like farming and land improvements;*
- f) *other _____.*

12.18. **Have you heard of the new national land law?** 1. YES 2. NO 97. Don't know
98. Refuses to answer 99. N/A

12.19. [IF YES] **Do you think the new law is having an effect on how you farm here?** 1. YES
2. NO 97. Don't know 98. Refuses to answer 99. N/A

13. MORE OPINIONS ABOUT TENURE:

13.1. **Let me ask an imaginary question:** I hope very much that you can keep your land as long as you want, but let's imagine that you knew you had to leave this land in, say, five years. Forgive me for saying that, but I only would like to know how farmers react to that kind of situation. Imagining that, how do you think that would affect your farming decisions? What would you do differently if you knew you couldn't keep this parcel as long as you want? 1=Less fallow; 2=less soil conservation; 3=less fixed investments (specify: _____); 4=less short-term inputs (specify: _____); 5=more short-term inputs; 6=other (specify: _____); 7=no difference; 97=don't know; 98=refuses to answer.

13.2. **Now let me ask a different imaginary question.** Let's imagine that you could certainly keep this land as long as you want, many many years, but when you stop farming you couldn't give it or sell it to anyone else, not even to your children. The land would go back to the headman (or the State), and he/they would allocate it to some other family. If that were the situation, can you imagine that it would change anything about the way you farm? 1=Less fallow; 2=less soil conservation; 3=less fixed investments; 4=less short-term inputs (_____); 5=more short-term inputs (_____); 6=other (specify: _____); 7=no difference; 97=don't know; 98=refuses to answer.

ADDITIONAL FARM INFORMATION: [Interviewer: get the information to fill in each of these tables.]

14. HOUSEHOLD's LIVESTOCK ASSETS: [Ask only if HH is not from PHS sample, i.e. is on settlement scheme.]

ANIMALS	# NOW	# IN 1998	INCOME, LAST 12 MO. ³
Oxen			
Cows			
Bulls			
Calves			
Goats			
Pigs			
Poultry			
Other			

◆ **QUESTION: Where do you water the livestock in the dry season? Do you have to pay anything for that water?** _____

ANY OTHER NOTES:

15. Equipment Use:

Equipment type	#	Owned, borrowed,	Equipment	#	Owned, borrowed,
----------------	---	------------------	-----------	---	------------------

³ Note: Income equals the proceeds from sale of animals or of animal products, like milk or eggs.

		rented, other?	type		rented, other?
Harrow			Planter		
Ridger			Cart		
Cultivator			Wheelbarrow		
Plough			Other		

Other farm and off-farm income last 12 months (including remittances, cash or in-kind): : [Ask only if HH is not from PHS sample, i.e. is on settlement scheme.]

TYPE or SOURCE	BY WHOM	AMOUNT	COMMENTS

16. LAND IMPROVEMENTS / FIXED INVESTMENTS:

Type	Field number	Quantity	When installed	Cost (incl. labour ⁴)	How financed	Length to maturity	Comments
Terracing							
Bunding							
Contour ridging / ploughing							
Well							
Irrigation							
Drainage							
Chemical treatment ⁵							
Organic treatment ⁶							
Fencing							
Tree planting (windbreak)							
Tree planting (crop)							Crop:
Dam							
Crop rotation							
Pot-holing							
Improved fallowing ⁷							
Storage structure							
Concrete house							
Burnt brick house							
Others (specify):							

⁴ If unpaid HH labour, ask for number of hours or days it took, and how many people worked on it; e.g. 2 people x 5 days.

⁵ Only those self-defined by farmer as long-term investment/improvement; i.e. excluding fertiliser thought to only provide same-year result.

⁶ Same.

⁷ Such as planting a crop (e.g. *sesbania sesban*) whose sole purpose is to rejuvenate soil fertility.

17. RECIPROCAL TRANSFERS (THIS YEAR AND LAST):

“Have you given or received any materials, labour, or land this year or last year, without payment, but maybe with expecting a favour later?”

Factor (note which year)	Type/Crop	Gave or received? From/to?	Amount/ time	Purpose/ reason	Traded for (if anything)?
Land					
Animal Traction					
Labour					
Equipment (implements , tools, carts etc.)					
Seed					
Fertiliser					
Produce					
Cash					
Other					

(this table is adapted from Sjaastad 1998)

18. RIGHTS OF USE, EXCLUSION, AND TRANSFER: [MODIFIED]

“Who of the following has this right?”

Right	HHH	Other HH member	Other relative	Fellow villager	Others outside village
Dig well					
Build a dam or weir					
Lend land for free					
Lend land for payment (rent)					
Give land to a certain person (whom?)					
Give land to anybody					
Sell land with chief's permission					
Sell land without chief's permission					
Sell land to other villagers					
Sell land to anybody					
Bequeath land to son					
Bequeath land to daughter					
Bequeath land to wife					
Register land for government title					
Transfer lease to someone else					
Renew or extend lease					
Other: ⁸					

- ♦ *[State land farmers only]* Do you still hold parcels in the traditional lands? (Please don't be shy—we don't think it's a problem if you do!) If so, who's farming those parcels? Can you estimate how many limas or hectares the parcels have?

ENDING:

19.1. Would you like to tell me anything else about these issues?

19.2. In case I didn't understand some of your answers, would you like to clarify any of the information you've shared with me before we finish?

Twalumba !!

⁸ Interviewer to ask respondent to volunteer any other rights that the respondent considers important.

NOTE: In making this questionnaire I am indebted to:

REPUBLIC OF ZAMBIA Central Statistical Office / Food Security Research Project. 2001. Supplemental Survey to the 1999/2000 Post Harvest Survey (for small and medium scale holdings). Lusaka: Central Statistical Office.
<http://www.aec.msu.edu/agecon/fs2/zambia/index.htm>

Michigan State University Food Security Research Project. 2000. "ZAMBIA POST-HARVEST SURVEY (1997/98) FOR SMALL AND MEDIUM-SIZED HOLDINGS (Synthetic Questionnaire)." Lusaka: Food Security Research Project. <http://www.aec.msu.edu/agecon/fs2/zambia/index.htm>

Sjaastad, Espen. 1998. *Land Tenure and Land Use in Zambia: Cases from the Northern and Southern Provinces*. (Ph.D. Dissertation, Department of Forest Sciences.) As: Agricultural University of Norway.